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OSTEO-ARTHRITIS AND ITS CONCOMITANTS*

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Osteo-arthritis is such a common disease that we are apt to take it for granted that we know all about it, and so fail to expend on the individual case that careful thought and unbiased consideration which the Hippocratic tradition demands of us. This state of affairs is made all the worse in view of the fact that osteo-arthritis is usually included under the general heading of rheumatic diseases, a curious medley when we consider that it is made to include such diverse entities as gout and rheumatoid arthritis, osteo-arthritis, and acute rheumatism.

The result of this confusion of diseases whose aetiology and pathology are entirely different is that when a method of treatment is advanced which may be applicable to one of them, it is apt to be indiscriminately applied to all. Even in these days of comparative enlightenment we sometimes see salicylates given as a routine for osteo-arthritis and vaccines for gout.

It seems, therefore, that it may be worth while to consider certain aspects of osteo-arthritis about which I have found that confusion has arisen both in my own mind and in that of others.

Definition

In the first place we must distinguish between what is osteo-arthritis and what is perfectly natural strengthening of the ligaments and their insertions. Round the knee or the spine and in the neighbourhood of all joints a certain amount of calcification is apt to occur in the muscular insertions so as to form spurs and exostoses. These seldom give any trouble or cause any symptoms, yet it is not very uncommon for patients to bring *x*-ray photographs of such bony outgrowths with a message from their doctor or even the radiologist that they are suffering from osteo-arthritis.

The exostosis of osteo-arthritis is essentially a compensatory phenomenon. The osseous protuberances are thrown out to bolster up an osteoporetic bone—that is, one which has been weakened by previous local destruction of calcium. I agree with Dr. Thomson of Harrogate that the essential characteristics of osteo-arthritis are the osteoporetic areas which occur in or about the articular ends of the bone, together with the primary destruction of cartilage which distinguishes this disease process from that of the rheumatoid type of arthritic change.

Pathogenesis

Osteo-arthritis, therefore, must be regarded as fundamentally a degenerative disease. It usually occurs in people of middle or advanced age and, I believe, in those whose vascular system is beginning to deteriorate. This deterioration is not necessarily general, at least in the early stages, and may be more marked in the region of one joint or one limb. This vascular deterioration leads to a relative malnutrition and consequent degeneration of structures whose blood supply is defective, and this is the primary cause of osteo-arthritic changes. Adjuvant to this is no doubt the fact that many joints the subject of osteo-arthritis have been previously inefficient as a result of congenital malformation, previous disease, trauma, or prolonged strain. It is not difficult to show the connexion between the type of damaged hip-joint occurring in such common childish orthopaedic disorders as congenital hip disease, coxa plana, and slipped epiphysis, and their correlates in osteo-arthritis of later life. Similarly, fracture within the capsule of a joint is frequently, if not usually, followed by some degree of osteo-arthritis. Secondary changes of a similar nature may be found as end-results of inflammations of various kinds occurring in joints, and should be regarded as not unexpected degenerative changes in a damaged joint rather than as an essential part of the original disease process. Thus it is not uncommon to obtain a history of previous trouble in an osteo-arthritic joint such as dysenteric arthritis in the hip, gonococcal arthritis in the knees, toxic arthritis in any of the large joints, and rheumatoid arthritis in the small joints.

In this connexion I may mention the menopausal or climacteric arthritis not uncommon in the knees and first metacarpal joints of middle-aged women on which Dr. F. G. Thomson and I laid stress.[2] Many people regard this type of arthritis as osteo-arthritic *ab initio*, but we believe that while it often does end in an osteo-arthritis, if properly treated by increasing the local synovial activity by heat and other means and by redressing the endocrine deficiency, especially that of the thyroid, the original arthritic process can be cured before any osteo-arthritis has supervened.

In other cases in which the osteo-arthritis is apparently primary it will be found that the joint has been subjected to a long succession of minor traumata or severe muscular strain. Witness the frequency of osteo-arthritis of the hips in those who hunt regularly, of the lumbar spine in gardeners, and of the fingers in tailors.

Pathology

The essential of osteo-arthritis is a defective circulation in the joint, and the result of this is that the centre of the cartilage begins to degenerate, becoming thinned and ridged (fibrillation of cartilage). Then the margins of the cartilage show proliferation and irregular lipping, and excrescences may form. These may become ossified and the outgrowths may become detached, so that loose bodies escape into the joint cavity. The synovial membrane may show signs of inflammatory reaction, but this is never so intense as in the rheumatoid joint, nor does proliferation occur with a pannus creeping over the cartilaginous surface. The bone, as has been said, shows

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areas of degeneration often cystic in appearance, and compensatory osteophytes develop, while surfaces exposed by erosion of cartilage eventually become hard and shiny (eburnation). The capsule and ligaments are at first fibrosed, but in late stages may disintegrate and disappear. This leads to marked deformity of the joints, since the muscles may form new and unusual bony attachments and pull the bones out of position.

Symptomatology

The symptoms of osteo-arthritis are pain, stiffness, and limitation of movement, and in late stages marked deformity of the joint. Pain is very inconstant and sometimes difficult to explain, since a joint which is very obviously distorted in the *x*-ray picture is not the seat of specially severe pain, while a patient who complains of agonizing pain may show comparatively little change in the joint. Two factors would seem to determine pain. First, the exposure of soft bone by the destruction of the superjacent cartilage ; this may explain why certain movements of joints are intensely painful while other movements are painless. In chronic cases eburnation may take place. The exposed bone becomes hardened and shiny like ivory, and movement on this surface is not apparently painful. The denudation of cartilage seems to be the result of pressure on degenerating tissue, and it is therefore more common in the weight-bearing joints than in the others.

The other factor in pain production is muscular spasm. That this is important is shown by the fact that occasionally a person who has suffered considerable pain may be entirely relieved of this after a hot bath, and walk away in complete comfort for a time. Such patients have even believed themselves cured, only to be bitterly disappointed an hour or two later by the return of the pain as the spasm reasserts itself. This observation would seem to throw doubt on the statement that muscle spasm is nothing but a reflex protective mechanism to guard the joint from undue movement and its resultant pain. In cases such as those described above movement is taking place, but there is no pain, and in hip-joint cases there may be intense spasm of the adductor muscles quite out of proportion to that in the other muscle groups surrounding and protecting the joint. This suggests that such spasm may be due to direct reflex irritation through the neuronic arc and segments associated with innervation of the joint quite irrespective of the function of protection against pain originating within the joint. These muscular spasms are, however, themselves painful, and may therefore contribute materially to the discomfort and distress of the patient.

The feeling of stiffness and the objective limitation of movement may be considered together. That either is due to the mechanical obstruction of osteophytic outgrowths or loose bodies in a joint may occasionally be true, but the relative freedom of movement of very stiffened joints under an anaesthetic shows the infrequency of this. Even where such movement is very restricted under anaesthesia, this is more often due to thickening of the capsule than to actual bony obstruction.

The chief causes of stiffness and limitation are the above-mentioned muscular spasm and the consequent fibrositis which develops in the affected muscles.

Fibrositis is either infective or metabolic, and in elderly people most often metabolic. The primary factor in metabolic fibrositis is the inefficiency of the circulation in removing the waste products of muscular action. It must be remembered that the efficiency of venous return depends in large measure on the contraction of muscles, and so when fibrositis starts, a vicious circle is established: more and more irritant waste material collects, more and more unelastic fibrous tissue is laid down to localize this, and so the stiffer and more immobile do the muscles become.

As will be seen when we come to discuss treatment this fibrositic element is of great importance, since it can be in large measure removed. The limitation of movement is by no means the same in all directions. The best example of this is the comparative freedom of movement in flexion and extension of the osteo-arthritic hip-joint when contrasted with the extreme limitation of abduction, adduction, and rotation. While changes in the bony architecture of the femoral head and acetabulum are to some extent responsible, fibrotic changes in capsule ligaments and muscles are chiefly at fault. This is even more so in the case of the shoulder-joints, where the bony changes are much less obvious and later in development, but in which the thickening and contractions of capsule and ligaments cause much pain and restriction of mobility.

Diagnosis

The diagnosis of osteo-arthritis, while suggested by pain, stiffness, and limitation of movement in a middle-aged or elderly person whose joint has been subjected to previous arthritis or violent or long-continued trauma, can only be confirmed by radiography. Such radiographs must not only show outgrowth of bone but also areas of rarefaction. The diagnosis is made more likely if there are signs of arterial degeneration and circulatory deficiency, local or general, while the presence of fibrositis in the surrounding muscles is important, since it may mask an osteo-arthritis, and the latter should always be excluded, though it is probably more common to find a patient labelled as osteo-arthritic when he is only fibrositic than the other way about.

As has already been indicated the distortion of joints and deformity of the limbs which occurs in late cases is due to contraction, stretching, and even disintegration of the capsule and ligaments and tendons in and about the joint.

Prognosis

The prognosis of osteo-arthritis must eventually be bad, since it is a slowly progressive process which must in the end disorganize the joint. In spite of this gloomy outlook, however, there is no question whatever that much can be done to arrest or at least slow down the progress of the disease and to relieve the patient's worst symptoms. The achievement of medicine in the last hundred years has not been perhaps to prolong life to such a very great extent, but to prolong fitness, so that instead of a man being too old at 40 he is often hale and hearty at 70 and a really useful citizen at 65. This has been achieved by preventing, or at least postponing, the encroachment of physical and mental degeneration which must eventually rob us of all our faculties, including the power to live. Such an achievement is creditable so far as it goes, but it ought to go further, and osteo-arthritis is one of the diseases which may benefit by our advances in knowledge and in skill.

General Treatment

In my view the possibility of treatment of the osteo-arthritic lesion itself, once it has been established in anything like an advanced stage, is very strictly limited, but I believe that much can be done to prevent development to that stage.

The treatment of osteo-arthritis is general, local, and adjuvant.

The general treatment must be directed to preventing degenerative disease, especially arteriosclerosis and cardio-renal disease. To this end appropriate dietetic measures and drugs are indicated, while certain forms of physical

treatment are useful. These are directed to increasing the efficiency of heart and kidney, more particularly by decreasing their load by dilating the superficial capillary bed and increasing the action of skin and bowels. If the physician can persuade himself that a focus of infection is contributing to the general degenerative process, then such a focus should be removed so long as the strain involved in its removal does not prove too much for the frequently elderly and sometimes feeble person, so that he "dies of his cure."

Local Treatment

The local treatment must be directed to increasing circulatory efficiency in the joint, relieving pain, and reducing muscular spasm.

At one time protein shock, which by its pyrexial effect "shook up" the circulation, had a vogue in the treatment of osteo-arthritis, and often for the time being produced favourable results, but on the whole relapses were found to occur, and the last state of the patient was no better than the first. Derived from this type of treatment are many others—large doses of vaccines which produce definite reactions, sulphur injections, and, more recently, gold injections, the resultant reception of the precious metal being more obviously beneficial to the physician than to the patient, at any rate in the osteo-arthritic group.

Of more direct benefit is the local application of heat by means of diathermy, radiant heat, and hot douches, which latter, incidentally, should be given for their thermal rather than for their percussion effect, and consequently should not be too violent, since anything like trauma to the joint is to be avoided at all costs.

For the same reason massage, which is referred to below as essential in the treatment of the concomitant fibrositis, must not be given to the joint itself, although when given to surrounding soft parts it may have a direct use in improving both blood and lymph circulation.

In a condition which is in many cases largely due to major or minor trauma, anything like forcible manipulation can have no place, although careful passive movement, especially if carried out in hot water such as can be provided by the large pool bath, may be of great service. For the same reason many of the surgical operations proposed for the relief of osteo-arthritis have proved disappointing or even harmful. The enthusiastic surgeon must remember that the osteo-arthritic patient is too often elderly and arteriosclerotic, and so a bad subject for prolonged and extensive operations which involve much shock. If one hip only is involved arthrodesis (if it can be brought off) is far the most satisfactory operative procedure, but sometimes the unhealthy bone refuses to unite, while in other cases the other hip rapidly becomes as bad as was the first, and a double arthrodesis is not practical politics. In a recent paper Mr. McMurray advocates the relatively simple Lorenz operation,[3] and there seems to be much to commend it.

Splinting may give much relief and effectually prevent further destruction of the joint, and for hip and knee cases a well-fitting walking calliper is of great service. It is, however, often difficult to persuade the conservatively minded and short-tempered old lady or gentleman to harness themselves with this "piece of damned ironmongery."

Adjuvant Treatment

Apart from this direct treatment of the osteo-arthritic joint I believe that osteo-arthritis is almost always accompanied by fibrositis in the muscles surrounding the joint. This is noticeable in cases of hip-joint disease, but still more so in cases of reputed osteo-arthritis of the spine. I use the word "reputed" deliberately because so-called spondylitis osteo-arthritica is so often no more than a mild degree of lipping at muscular insertions inevitable in those whose occupation has subjected their back muscles to severe and continual strain. Many such subjects, however, present themselves with really severe pain and stiffness of the back and a diagnosis of osteo-arthritis of the spine with a correspondingly gloomy prognosis. In many such cases the osteo-arthritis is minimal and the accompanying fibrositis maximal, and the chances of successful treatment of the fibrositis, and therefore of the patient's disabling symptoms, are eminently favourable if the condition is understood and the correct methods used.

If the pathogenesis of fibrositis is appreciated as frequently due to the failure of elderly patients to eliminate their metabolites then it becomes clear why it is so often found in conjunction with osteo-arthritis; and since fibrositis is an essentially treatable condition, the outlook for the alleviation of the patient's worst complaints and disabilities, when the arthritis is not too far advanced, is correspondingly rosy.

I believe that the theory that fibrositis is dependent on infective foci has been much overstated. I do not wish to suggest that such foci should not be sought for, or that when they can be removed without too much consequent disturbance of the patient that they should not be extirpated for the benefit both of the osteo-arthritis and of the fibrositis. I do believe that they may be directly responsible for fibrositic reactions, and also that the whole metabolic balance may be upset by such foci, but in other cases the metabolism may be deranged and fibrositis initiated as a result of entirely different causes. It is true that inflammatory reactions of the synovial membrane are met with in osteo-arthritis, and these may indicate a secondary low-grade infection, but such reactions are not nearly so constant or obvious as in the rheumatoid type of arthritis. Hence, in osteo-arthritis and in the fibrositis of elderly people I would most strongly deprecate the wholesale clearing of a mouth without due care and consideration, and I cannot say that I have been much impressed by the ultimate results of removal of tonsils in persons over 35 as a means of "cure" for either of these conditions. With regard to fibrositis I believe that in the majority of cases of fibrositis in middle-aged and elderly people the fault is primarily metabolic, and due to impaired circulation and faulty elimination, and that this is specially the case in muscular fibrositis.

It will be seen, therefore, that the same sort of bodily condition as is apt to be associated with osteo-arthritis may form the soil on which fibrositis is grafted. Moreover, the two disease processes play into each other's hands. The muscles round a joint which is the seat of disease are required to act as splints. This involves increased tone, increased strain, decreased mobility, and decreased circulatory efficiency, all of which promote the development of fibrositis. With the fibrositic involvement the muscles become less efficient and tire more easily. As a result the splint from time to time gives way, and so the joint is subjected to minor but recurrent traumata, with a resultant intensification of the osteo-arthritis. This vicious circle may continue till all the muscles round the joint are affected both by the increasing fibrositis and by the increasing spasm. It is true that the greater the postural tone of the muscle the more efficiently will it act as a splint; but increased tone soon passes into spasm, and the decrease of its efficiency arising from the resultant and accompanying fibrositis means that postural tone has got to be bolstered up by fibrositis, and this may lead in the end to severe contractures and deformities. As has already been said, the spasm and contractures themselves are responsible for a great deal of pain, and if these have not been prevented in the early

stages division of such contracted muscles, as, for example, in the adductors of the hips, may give enormous relief and restoration of mobility to the joint even in late cases, at least for the time being.

From these considerations it is clear that all the disability of the osteo-arthritic does not depend entirely on the condition of his joint, but that, as in many other diseases, processes which have begun as Nature's effort to relieve the patient have gone too far and themselves become disabilities. The chief of such secondary disabilities is undoubtedly fibrositis, and in every case of osteo-arthritis this condition should be sought for and treated.

Fibrositis may be recognized by the presence of "nodules." These are hard nodes or bands which can be felt against subjacent bone when the muscle is relaxed. The examining finger requires a certain amount of education to detect these, but once the physician really recognizes the feel of them there is little or no difficulty. The nodules may or may not be tender, and if not tender they are a potential, if not an actual, source of distress to the patient. In the cases under discussion, however, the nodules are usually exquisitely tender, and the patient will squirm and contract his muscle when they are pressed, and will often complain of pain referred down the distribution of an adjacent nerve trunk.

The objects to be aimed at in the direct treatment of fibrositis—that is, irrespective of promoting general health or removing septic foci with due precautions—are threefold:

1. To break down the fibrous nodules and liberate the imprisoned toxin.
2. To promote local and general circulatory efficiency so that these toxins may be cleared from the muscles and fibrous tissue and conveyed to the excretory organs.
3. To encourage elimination, especially by the skin and kidneys.

The first object can, I believe, only be efficiently attained by massage, but just any massage will not do. The masseuse must first of all have trained her fingers to discover the nodules in the muscles. She must then have learnt how to manipulate them against subjacent bone so as to rub them away, and she can only do this if she knows how to get the particular muscle which she is treating properly relaxed. She must realize that at any rate at the beginning of treatment this massage is painful for the patient, and so she must temper the wind to the shorn lamb. At the same time she must persevere, and have the tact to make her patient persevere, because he will not get better until the nodules are removed. Neither the patient nor the physician should be unduly alarmed by the appearance of bruising as a result of the massage, since with the brittle condition of small vessels this may be inevitable if the breaking down of the nodules is efficiently carried out.

The massage may be given "wet" or "dry." Wet massage, generally given by the Aix or Vichy method, has the advantage that the continuous application of hot water in the form of a douche or rain helps to reduce muscular spasm and relieve pain. If, however, a really skilled masseuse is prepared to devote time, patience, perseverance, and sympathy to her patient, I believe that dry massage is preferable, since more time and care can be given to locating and removing individual nodules.

The improvement in circulation is best brought about by the combined thermal and percussive action of hot douches applied locally to the muscles but not to the joints, while similar results may also be induced by radiant heat, diathermy, etc. Similar methods may be used to promote elimination by the skin, and, in my opinion, the deep pool bath with the undercurrent douche of water hotter than the main bath is the most generally useful treatment. Since this has been mentioned as a good rational treatment for osteo-arthritis it is doubly useful for the treatment of such patients as we are at present considering.

Renal elimination may be promoted by fluids, especially by certain of the natural waters.

A word may be said, in conclusion, as to diet in osteo-arthritis and fibrositis. There is no specific diet for either of these conditions, yet diet is important. Each individual must be considered on his own merit. If he weighs too much he must be rationed in his carbohydrates, for overweight must be very bad for a damaged weight-bearing joint. If he is plethoric and shows a tendency to hyperpiesis, he must be rationed in his purines, because arteriosclerosis and cardio-renal degeneration must be checked at all costs. Similarly, protein and salt in the diet must be considered in relation to renal function.

Since metabolic disturbances are largely responsible for the conditions under discussion, indigestion must be prevented if at all possible, and in this respect diet may be of the greatest importance. In fine, do not treat the joints of an osteo-arthritic, treat the patient.

Conclusions

1. Osteo-arthritis is a degenerative disease occurring as a rule in elderly patients with failing circulation and elimination, and affecting joints previously damaged by strain, trauma, or disease.

2. The essential pathology is a degenerative change in the central cartilage leading to thinning, ribbing, and finally disappearance, with exposure of underlying bone. The bony changes consist of formation of exostosis and eburnation of exposed parts. The capsule and ligaments are at first fibrosed, but may eventually disappear, leading to new muscular attachment.

3. The pain in osteo-arthritis is due to pressure on exposed bone and muscular spasm.

4. Stiffness and limitation of movement are only occasionally due to exostoses and loose bodies, but generally due to fibrositis, muscle spasm, and fibrosis of the joint capsule.

5. Deformity is due to changes in bony architecture and to new attachments of muscles pulling the bones out of position.

6. Prognosis, though eventually bad, should not be too gloomy, since much can be done to stop or delay progress and to remove the concomitant fibrositis.

7. General treatment consists of measures to arrest cardiac, renal, and vascular degeneration, especially those which will dilate the capillary bed and promote elimination by skin, kidney, and bowels.

8. Local treatment is directed to increasing circulatory efficiency of the joint, relieving pain, and reducing muscular spasm.

9. No trauma must be applied to the joint, therefore manipulation must be carried out with the greatest care, and operative procedure is only applicable to carefully selected cases.

10. Splinting is often very useful, especially the walking calliper in hip and knee cases, if the patient can be persuaded to tolerate it.

11. Adjuvant treatment is chiefly directed to the accompanying fibrositis. In the elderly subjects of osteo-arthritis this will consist of the right kind of massage and eliminative methods, chiefly in the form of physical and hydrotherapeutic procedures.

12. Removal of septic foci will only have a secondary place, since both the osteo-arthritis and the fibrositis are chiefly due to metabolic changes consequent on vascular degeneration and faulty elimination.

13. Diet in fibrositis and osteo-arthritis is not specific, but is often of importance in so far as it may reduce obesity, prevent cardio-renal degeneration, or preserve the patient from metabolic disturbances due to indigestion.

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SEA BATHING IN THE TREATMENT OF SURGICAL TUBERCULOSIS*

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It is strange that while the value of properly planned sun bathing in the treatment of surgical tuberculosis is now universally recognized and applied, comparatively little attention has recently been paid to sea bathing in this disease. Yet it has a very real claim on our consideration.

Two Pioneers of Sea-Bathing Treatment

It is unnecessary to go at length into the history of sea bathing from its therapeutic aspect, but mention must be made of two of the pioneers in its use: one Lettsom, a physician of great distinction, who was a founder of the Medical Society of London and of the Sea Bathing Infirmary at Margate ; the other, now almost forgotten, a certain Dr. Richard Russel, generally called "Seawater Russel," who was born in 1687 and died in 1759. Russel wrote two books on the efficacy of sea bathing and sea-water drinking in the cure of various diseases, more especially in tuberculosis of the glands, bones, and joints, and scrofulous diseases generally. He claimed that he wrote from the outcome of years of observation. He said that he had noticed that fishermen rarely had scrofulous diseases, and that their women had good complexions, beautiful teeth, and sound gums. He described how children who were delicate and pale, overclad and glandular, when sent to him for treatment, had been returned to their parents after sea bathing, bare-necked, bare-headed, tumours of the neck cured, and countenance healthy. He supports his claims with convincing details of many cases successfully treated. Doubtless a measure of his success was due to necessarily synchronous sun bathing, but the value of sunlight appears to have escaped him. He practised at the little village of Brighthelmstone, now Brighton, which owes to him its popularity, and it is worthy of note that Russel's first book made him famous at the advanced age of 63. His success was instantaneous and amazing. Sea bathing became a popular and fashionable cure, and its devotees soon turned it into a national pastime. Everyone who was anyone essayed cure by dipping into the brine.

The value of the summer holiday by the seaside is now such an accepted fact in English life that it is difficult to remember that it was unknown until the reign of George II, and only became really popular when George III made Weymouth "Royal." Before Russel died he had made the reputation of Brighton, and it has continued to rise steadily in favour and popularity. Russel's works had an enormous vogue both at home and on the Continent. But in England the pleasures of sea bathing became so overwhelming that its therapeutic effects were soon forgotten. On the Continent Russel's books were still read well into the nineteenth century, and Michelet, in his poem, *La Mer*, calls him "Inventeur de la Mer": there seems no doubt that he was the father of all seaside pleasure resorts.

Lettsom, much impressed by Russel's work, founded the Sea Bathing Infirmary, now the Royal Sea Bathing Hospital at Margate. As Johnston Abraham says in his delightful *Life of Lettsom*, from which I have freely quoted, Lettsom's fame is made secure by the fact that he is the father of all the open-air sanatoria throughout the world, because he founded the Sea Bathing Infirmary. Continental observers have grasped this, and it does not matter in the least that it was thought that sea water rather than sunlight effected cures at Margate. From the start this hospital had an open-air solarium for the patients, suggested and insisted upon by Lettsom, who had a passion for sunlight and fresh air.

An Experiment in France

Following the Napoleonic wars an increased and virile population became an essential requirement in France. Tuberculosis was rife in both its pulmonary and its surgical forms. Measures to combat and, if possible, to cure the disease engaged active attention. A commission appointed by the French Government heard rumours of the success of a fishwife at Berck-sur-Mer, a tiny fishing village near Boulogne. Her methods were investigated, and it was found that she cured scrofulous and deformed tuberculous children by the simple method of merely exposing them to sun, air, and sea water on the wide beach at Berck. The hint was taken, and a large municipal hospital was erected at Berck, to be followed by numerous other institutions. These continue their beneficent work to this day ; but a point of great interest, common both to Margate and to Berck, is that while the value of heliotherapy is increasingly admitted and utilized, sea bathing has been neglected and as a therapeutic measure almost forgotten and abandoned. It is my purpose to emphasize its value and explain the technique of its practice.

My own interest in, and love of, sun and sea bathing dates from childhood, and I attribute much of the good health which I have enjoyed to long summer holidays, both as schoolboy and as student, spent on or in the sea. When it fell to my lot to start the Cripples' Hospital at Alton in 1908 I immediately practised sun treatment on the children under my care, and I would remind you that sun bathing for therapeutic purposes was at that time unknown in England. Similarly, as soon as the hospital was able to secure a marine branch, I started sea bathing as a therapeutic measure.

The Marine Hospital In Treatment of Tuberculous Cripples

It is well established that during a long and trying illness climatic change and altered environment may often be utilized with advantage. For the children of the well-to-do that is a simple matter, but the need exists equally for the hospital patient. It was to meet this need that we established a marine branch at Hayling Island. The advantage of having two institutions, the one inland and the other at the seaside, under the same management and control, so that continuity of treatment as well as climatic change may be satisfactorily ensured, must be obvious. But there are certain desiderata in the site selected that should be fulfilled. The climate should be mild and equable ; there should be abundant sunlight of high actinic value ; the rainfall should be low, there should be absence of mists and fogs, and there should be no atmospheric or water pollution. The hospital should be situated right on the beach and in the closest proximity to the sea safely attainable. It should be remote from a town, so that patients have unrestricted

* Presidential address to the Section of Public Health at the Annual Meeting of the British Medical Association, Melbourne, 1935.

use of the beach for the purposes of treatment and pleasure without interference from visitors. At the same time, by ensuring the absence of visitors the patients themselves are not a source of annoyance, repulsion, or even possible danger to others. As many of the patients are cripples not only must the hospital be situated right on the beach for convenience of access to the sea, but the littoral must be flat, with absence of cliffs or rocks for the safety and comfort of the patients. There should be an extensive beach with wide excursion of tide to ensure cleansing, and the hospital should be so situated that the prevailing wind blows across the moist sands charged with substances known to be stimulating and tonic. Nevertheless the hospital should be so placed that it is in no danger from exceptionally high tides, heavy seas, or gales.

Actually, our marine hospital faces south-east, from which quarter winds rarely blow, and they never provoke heavy seas. The prevailing winds are from the south-west, so that sand is never blown into the hospital, but always away from it, and is not a cause of annoyance or discomfort to the patients. This important point is frequently overlooked. Moreover, the hospital facing south-east has all the benefit of morning sun and reflected ultra-violet light from the sea, so therapeutically valuable. Hayling Island is the sunniest district on the sunny south coast of England, and has the lowest rainfall. To the south-west is the Isle of Wight and north of it are the South Downs. Its low rainfall is explained by its geographical situation. The rain clouds coming up the English Channel are attracted by the hills of the Isle of Wight, and deflected to the North Downs, north of Hayling Island. Often rain may be seen falling north of the island while it is quite dry and cloudless on the island itself. The rainfall is nearly 50 per cent. greater ten miles north of the island than it is at Hayling. Also, the sandy, absorbent soil rapidly removes any rain which may fall. The climate is mild but bracing and equable, and this in conjunction with the low rainfall and abundance of sunshine of high actinic value renders it especially suitable for open-air treatment all the year round. The hills already alluded to, north of the island, besides diverting rain protect the hospital from cold winds from the north.

The hospital property is in the form of a peninsula, so that it has sea and 1½ miles of beach practically all around it. The island is situated at the entrance of a wide land-locked bay, from which stretch inlets extending far into the land. This bay has to be filled and emptied twice daily by the tide, which races past the hospital, scouring the beach with pure sea water from the English Channel. The site of the hospital, which is unique, was chosen after careful examination by car of the whole of the south coast of England, from the mouth of the Thames to the mouth of the Severn, and in our crowded little island it is a source of satisfaction that so suitable a site could be found so admirably adapted for the needs of a marine hospital. Doubtless in Australia many equally suitable sites, with convenient access to towns, are to be found, but in England no comparable site, so far as I am aware, is anywhere available.

The patients are conveyed to the Marine Hospital from the parent hospital at Alton by motor ambulance. The nurses likewise come from Alton to serve for periods of from three to six months, and thus are fully conversant with the nursing methods we employ. The short period of their stay at Hayling renders it attractive ; many of the nurses bathe all the year round, whereas if they were permanently employed at Hayling its remoteness would render it less desirable and more monotonous, and difficulties in staffing would be increased. I personally examine each patient at Hayling at least once weekly.

Type of Case Sent to the Marine Hospital

By the establishment of two hospitals, one inland and the other marine, under one management, with complete control as to the type of case sent to each, much information of considerable value has been acquired as to the type of case likely to obtain the greatest benefit from marine treatment. I had hoped that the more weakly patients who were responding only very slowly to treatment would improve rapidly, but that is rarely the case. The weakly, cachectic, freckled, marasmic child, the child with a muddy complexion, lethargic in habit, who does not bronze readily on exposure to sunlight, with little power of response to natural stimuli, rarely does well. Very few sick children under the age of 5 derive real benefit ; for these the less vigorous and clamant conditions prevailing inland are to be preferred.

A little consideration makes the reason obvious. The stimulus of sun, open air, tonic sea breezes, and sun bathing makes too heavy a call on their vitality: they have not adequate power of response. The nature and extent of the lesion matters little. The whole success of marine treatment of these cases depends entirely on the ability of the patient to respond to the strong stimuli supplied. Those who cannot respond satisfactorily are exhausted in the effort. They become quieter, and often peevish and irritable. They need more food, but are unable either to digest or to absorb it. They often vomit, are bilious, and, as colloquially described, "liverish." They feel tired without understanding the cause of their fatigue. They are in a katabolic rather than an anabolic state, and hence they tend to waste and get thin. Their skin becomes dry and harsh, and the subcutaneous fat is rapidly lost. Frequently there is slight and irregular pyrexia. These symptoms at times are alarming, and can only be remedied by prompt return inland. Experience has taught us readily to recognize such cases at Alton, and these children are not sent to the seaside until their powers of response to natural stimuli have been so fortified and attuned that we know when they have reached the stage of vigorous potential and desirable reaction.

I have stressed the case of children in my experience found unsuitable for marine treatment because it is of extreme importance to avoid disappointment and failure. Naturally, there will be a considerable intermediate class who will do well under healthy and hygienic conditions, both inland and at the seaside, and others, who, if carefully supervised at first, will gradually acquire the necessary power of response to marine conditions, either wholly or partially applied. Suitable cases and cases likely to respond well are children of good constitution, who, even if their local lesions are causing anxiety, can react satisfactorily. Children doing well over the age of 5 years, with good digestion, who sunburn readily, who are braced by exposure to cold air, and who react to natural stimuli inland will, in almost all cases, do better still at the seaside.

Especially interesting is the improvement observed in children responding well to sun treatment inland, but who reach a point where further progress is arrested. In these still more rapid progress and acceleration of cure is often observed when they are transferred to the sea, and that to a remarkable degree.

Effect of Open Air and Marine Treatment on Basal Metabolism

Working at Alton and Hayling Island, Sir Leonard Hill and Dr. Argyll Campbell showed that the basal metabolism of the patients under our care was gradually and safely raised, and that after two to three months' treatment the average basal metabolism of recumbent Alton

patients was 40 per cent. above that of the average child. This increase of basal metabolism is not due, as had been supposed by many, to sun treatment, but to exposure to cold air, and it occurs equally in summer and winter if patients are appropriately handled. Excessive continuous increase of basal metabolism is often harmful and is to be deprecated. Children should not be exposed to such an extent that they shiver and complain of cold. Their skin, during exposure, should feel warm if they are reacting properly. Sudden and temporary increase of basal metabolism is highly beneficial if followed by a feeling of well-being and exhilaration. Beyond that point it must not be pressed.

Marine treatment offers the readiest means of so influencing basal metabolism. Controlled loss of heat from the body following exposure to cold air or water necessitates the generation of heat in the body. Work has to be done. More food must be consumed, digested, absorbed, and built up into the tissues. Increased oxygenation is called for, and there is greater elimination of waste products through the lungs, the kidneys, the skin, and the bowels. This increased tissue change takes place not only in healthy but also in diseased tissues; hence the process of repair in tissues diseased is intensified and expedited. While exposure to cold air raises the basal metabolism to a point, more effective and more easily controlled increase of basal metabolism is obtainable by spraying, paddling, or immersion in cold sea water. Such treatment is of the utmost value to those patients who can make adequate response. It should be followed by a feeling of well-being and exhilaration. The skin should glow and be warm. If, on the other hand, the patient is cold and shivers, his teeth chatter, his circulation is impaired, his face is blue and pinched, his fingers are white and bloodless, obviously harm may be done; a satisfactory reaction has not been obtained, and the treatment for such a patient is totally unsuitable and to be deprecated. But given a patient capable of responding suitably to immersion in the sea, the basal metabolism may be raised during the bathe to no less than 1,000 per cent. above the normal. Such an increase of basal metabolism may seem almost incredible, but it nevertheless occurs, and in selected cases is of the utmost value to the patient.

The patient may be said to enjoy the effects of the most skilled general massage without himself moving in any way, and administered more perfectly than could be accomplished by the best masseur. This effective exercise without movement cannot but be beneficial to a child who, by the very nature of his disease, a tuberculous arthritis, must of necessity remain immobile. But under the influence of sun, sea air, and sea water, muscles long atrophied fill out and become firm and hard, the patient enjoys a sense of physical well-being, and an important aid to cure has been accomplished.

Technique of Therapeutic Sea Bathing

The selected child, on arrival at the marine hospital, is first acclimatized and gradually exposed to sun and sea breezes. If the ill effects which unsuitable cases show are not apparent, he (or she), if ambulant, is allowed to paddle for short but increasing periods in the sea daily, care always being taken to see that the child is not fatigued. Later the body is sprayed with sea water, and, finally, but only after some days and if the patient reacts satisfactorily, total immersion is permitted. If the case is an ambulant one, the patient bathes within a net which has been pegged into the sands. This is a wise precaution, for while it allows the free flow of fresh sea water (and it is fresh and uncontaminated sea water which is needed), all danger is avoided and the child is under suitable control and restrictions.

A porter in waders is always present in the water with the children, and a sister, with nurses in attendance, stands on the beach to supervise the bathing, direct the children when to return to the shore, and undertake the necessary treatment after the bathe. Children who cannot walk are carried into the sea on netting stretchers laced on to an iron frame and dipped into the water one or more times as may be ordered. After a week or two they are allowed to remain immersed in the sea for increasing periods as may be found advisable.

Paddling or spraying is not, as a rule, permitted until the temperature of the sea reaches 58° F.; total immersion is allowed when the temperature reaches or exceeds 60° F.; the optimum temperature is usually between 65° and 68° F. When the temperature is lower than the minimum permitted, sea water should be heated to the temperature desired, but one has the impression that unheated water is best, and in any case the water should never be heated above about 70° F. Warmer sea water becomes less beneficial; it is sticky and unpleasant to bathers, and is increasingly enervating and decreasingly stimulating.

At Hayling Island the rising tide is to be preferred to the falling tide—it is fresher, more saline, and more invigorating—but if this is inconvenient bathing on the falling tide is permissible. The best time for bathing is about two to three hours after breakfast, and if it is a bright sunny morning and there is a rising tide as well then good results may be anticipated. The temperature of the sea is usually a little higher on the rising tide in the winter and lower on the rising tide in the summer. We have now constructed a bathing pool so that we are independent of the vagaries of tide and able to select the time for bathing which experience has shown most suitable.

What Happens During the Bathe

The patient on immersion experiences a cold shock. The surface of his body is rapidly cooled, there is superficial vaso-constriction, and heat is rapidly abstracted from the body. The child involuntarily gasps for breath, the lungs are fully distended with pure sea air, and more heat is abstracted via the respiratory organs. The rapid and deep respiration is of considerable benefit; there is increased excretion from the mucous membranes as the child spits and splutters. Associated with this is an immensely increased oxygenation of the tissues with a correspondingly greater elimination of carbon dioxide.

Bathing has also valuable diuretic properties. The heat-regulating mechanism comes into play; there is profound alteration in the circulation and richly oxygenated blood is pumped through the body. Initially the best effects are produced by a short bathe, but later a longer period is required in the water, to the evident enjoyment of the child, who splashes, paddles, and learns to swim with obvious delight.

After the Bathe

It is now our purpose to get the greatest possible reaction. The child is taken from the sea and placed in a pen with a warm planked floor and wattle hurdle surround. The latter, while completely obstructing the wind, allows free circulation of air. There is no covering over the pen. In the centre is a large iron brazier, in which a coke fire is burning brightly, radiating welcome and pleasing heat. Along one side of the pen is a wooden trough containing warm water. The child is wrapped in a warm bath towel, well dried before the brazier, and then sits with his feet in hot water and is given a warm drink. Rapidly he becomes warm and glowing. The place resounds with merry laughter. Those who are able to do so link arms and dance round the fire, and then all rest for a quarter of an hour in the warm pen, and

afterwards play on the beach in the bright sunlight till dinner comes along, and an abnormal amount of food is consumed with eager voracity. There follows a period of rest while the food is being digested. The technique for those who cannot walk is much the same, except that their bodies are sponged with warm water instead of having their feet placed in the trough. They, too, enjoy a sun bath after the initial period of rest.

Effect of this Treatment on Patients

Again I would emphasize the need to select patients suitable for the treatment outlined above. Almost all will sooner or later benefit by it, but in many cases we may have to wait a considerable time before it can be applied with advantage. To get the best results I insist upon short immersion in cold sea water rather than long immersion in warm sea water. For English children certainly the cold of the fresh English seas is more suitable than the warm but enervating Mediterranean, and, indeed, I have found the same to be true for children who come from the Tropics. In all of them there is greater metabolic activity, repair is hastened, muscular tone is improved, recalcification of lesions is stimulated, tuberculous glands are more rapidly absorbed, and on sinuses, not kept discharging by dead sequestra, there is an initial marked increase of discharge followed by rapid healing with supple non-keloidal scars. The evolution of tuberculous abscesses is often checked. In short, healing is hastened. The psychological effect is marked: happiness, vivacity, joy of life, is apparent.

Russel also advocated the drinking of large quantities of sea water, but as to the value of this procedure I hesitate, at the moment, to express an opinion.

RADIATION THERAPY OF TONGUE CARCINOMA*

BY

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The tongue is one of the commonest sites in males in which carcinoma occurs, representing 8 per cent. of cases according to Souttar.[1] It appears to be much commoner in males in Great Britain, but it is interesting to note that in the Philippine Islands Fernandez[2] reports that of twenty-one patients treated fourteen were females. It is a site where extensive loss of tissue produces a most distressing mutilation, and therefore one where it is of paramount importance to conserve as much of the normal tissue as may be possible. It is in this site, as in intra-oral carcinoma generally, that it is possible to speak as does Birkett[3] of a revolution in treatment having been brought about by radiotherapy.

Radiotherapy, like ablation surgery, is a purely local method of removal of malignant tissue. We have very little knowledge of how this removal is brought about, but it depends on a differential destructive action which is the greater the more undifferentiated the tissue and the more frequent the mitosis.[4] It would thus appear that the future control of malignant disease by radiation depends in part on the discovery of means of accentuating this differential action and in part on the earlier commencement of treatment. But so far as the carcinoma in the tongue remains a local disease, and, in particular, before it has extended from its original site to the regional glands, it is eminently curable if sufficiently radiated. This radiation can be brought about without any ultimate loss of tissue other than that occasioned by the removal of so much, and no more, of the tongue as is carcinomatous.

The Normal Tongue

From the physiological point of view the tongue is concerned with speech, and also partly with the sense of taste. It is uncommon for taste to be seriously affected, and the mobility of the tongue and the degree to which it remains intact influence the extent to which normal speech remains possible. Radiation, however, markedly affects among normal tissues the salivary glands, and hence it is that dryness of the mouth is usual in patients treated by radiation for carcinoma of the tongue. But recovery in some degree of the secretory glands and habituation in part lead, as time goes on, to an amelioration in this symptom.

Anatomically, the tongue consists of two longitudinal muscular masses. Joined medially by a fibrous layer, they are covered on their free aspect by squamous epithelium. The anterior two-thirds of the tongue lies in the mouth, and the posterior third forms the anterior wall of the pharynx. The blood supply is derived from the lingual arteries. The lymphatic drainage of the anterior part of the tongue is to the submental glands and the anterior cervical glands. From the lateral part drainage is to the submaxillary group and to the upper cervical glands. At the root of the tongue median vessels pass through the muscles to end in the submaxillary groups.

The Histological Picture

Histologically, the growth from the mucous membrane is a squamous-celled carcinoma showing differentiation to a greater or lesser degree. In a recent series of seventeen biopsies of my cases, five were reported as squamous-celled carcinoma without amplification. Of the remaining twelve, one showed moderate differentiation, whilst in eleven the growth was well differentiated. None of these, however, had originated in the posterior third of the tongue, where growths of very anaplastic type may occur.

In general, the less differentiated the growth the greater the response to radiation. But this apparent advantage is more than offset by the increased likelihood of early dissemination. When, however, it is a matter of judging the course an individual case is likely to follow, the histological picture is not always a sure guide to the response that can be expected. Indeed, Martin[5] thinks grading is of little value except as regards the probability of early metastases. The view formerly held by many that biopsy increased the probability of metastasis does not obtain to the same extent to-day. The absolute amount of tissue excised is not very large, and the trauma consequently slight, but to be on the safe side I prefer to use a small snare with a diathermic current of very high periodicity. Little distress is caused the patient, and the tissues are instantly sealed. With the very high frequency the depth of tissue coagulated is small, and hence small portions removed at the growing edge enable a sufficiently large section to be made to permit study of the growth.

It is preferable to put the mouth in good condition before implantation of radioactive sources, and, in particular, to remove septic stumps or dead teeth and to treat those teeth that are carious. But the advantages are not all on the side of unduly extensive teeth extraction, nor can it be said that no risk exists of the implantation of cancer cells in a socket whence recently a tooth has been extracted. Some patients, too, may fail to see the connexion between removal of highly valued teeth and their tongue ulcer, and so refuse extraction. In such cases I have not observed any untoward result from

* Read in opening a discussion in the Section of Radiology and Therapeutics at the Annual Meeting of the British Medical Association, Melbourne, 1935.

implantation without interference with the teeth. It is well in cases of this kind, however, to pack the tongue away from the jaw with gauze. Even when the mobility of the organ is destroyed the displacement of the source of radiation a few millimetres from the jaw greatly diminishes the radiation this may receive.

Methods of Irradiating Primary Growths

There are several methods possible of irradiating the primary growth in the tongue. It may be done either by interstitial, surface, or distance methods of employing radium or radon, or by Roentgen rays from a greater or lesser distance.

Interstitial methods first employed by Dominici[6] were those in which a metal container enclosing the radioactive material was embedded in the tissues. The radiation employed nowadays is the gamma radiation from radium C (C′, C″) obtained from radon gas. This radon gas in the case of "seeds" is filled into them from an external producer of the gas—namely, a radium salt in solution. In the case of "needles" the radium is contained in the hermetically sealed needle, and there produces its radon gas, which in turn changes to radium C, from which the gamma radiation arises.

Now by reason of the fact that radium changes into radon very slowly, while radon changes much more quickly (the ratio of the times is approximately 150,000 to 1), it follows that a radium-containing needle emits a constant radiation over periods of time very considerable as compared with those employed in treatment, while from a radon-containing seed the radiation diminishes to one-half of its initial value after approximately four days. Thus, from the practical point of view, if seeds are used the radiation intensity, relatively strong at first, diminishes to a negligible fraction of its original strength at the end of a week. With radium needles a uniform intensity of radiation is obtained throughout the period of treatment. In practice, however, if the total dose be correct, this variation of intensity during treatment is of no disadvantage. Seeds, on the other hand, are of negligible intrinsic value, and can be made very much smaller than needles. Furthermore, it is possible to utilize a greater proportion of the length of the seed than is the case with a needle, the active length of which (or that part from which the radiation is emitted) is much less than the total length, more especially in small needles such as are used for the tongue. The preparation of seeds, however, requires a radon-production plant, and so, except in larger centres, is not convenient.

Interstitial methods are the methods chiefly employed, but for a small accessible lesion use may be made of a surface applicator, preferably in a ring or hollow square form. Distance radium, or beam, or "bomb," or—to employ the French term, télécuriethérapie—does not lend itself conveniently to treatment of a primary lesion situated in the tongue. The needles I have used have been of low linear intensity—namely, 0.66 mg./cm. In making an interstitial implantation it is first necessary to judge the extent of the tumour. This is not always easy, but a boundary well outside any induration or deformity should be chosen.

Technique Using Radium Needles

It is now necessary to plan the radiation so that the whole volume chosen as definitely enclosing the tumour shall be irradiated as uniformly as possible. An approximation, but an approximation only, to the necessary dosage is given by allowing 1 mg. of radium element per c.cm. of such space. But in small tumours this will be much too small and in large tumours somewhat more than is necessary. The needles are placed so as to irradiate the margins of the growth, and also beyond them to include as much healthy tissue as will ensure that the radiation at the growing margin and a safe distance beyond it is reasonably uniform. Time—about ten days; but this varies with the nature of the tumour.

Various methods of fixing the needles in the tissues have been described, and it is claimed as an advantage of radium needles, and also for needles containing seeds, that they permit a more accurate fixation and distribution than is possible with seeds alone. Pridie[7] has described a method of fixing a needle at both ends, and Muir[8] has worked out a technique for fixing seeds. Souttar[1] and Birkett[3] recommend the fixation of the eye of the needle by a catgut stitch in the mucous membrane, but in my experience, if the thread to which the needle is attached is led to the same side as that to which the point of the needle is directed, the needle will not become displaced. If the threads are disposed in this manner they may be grouped—for example, one group for each side. The threads of a group can either be fixed with a single stitch to the tongue or else taken out directly through a fine rubber tube and strapped to the cheek. If a needle does come out it can usually be reinserted in position without much difficulty, except in those cases in which the growth is extremely friable.

It is important in inserting a needle to see that the eye goes just beneath the mucous membrane where this is intact. The intensity of radiation at the end of a needle is relatively very low, and for this reason it is essential that in planning the distribution this be arranged so that the ends and points are in normal tissue, except where the point does not penetrate so far as to the opposite side of the growth. In this case a second row from that side is necessary. In large tumours the central portion should have its needles further apart than is suggested above. Instead, the distribution of the needles may be that of a broad ring, the effect of which will be to give an approximately uniform radiation throughout the tumour. In any case of doubt, the radiation being uniformly distributed, it is better to over-dose than to under-dose, for while a local recurrence can be re-treated, this is not so simply nor so safely done as is the removal of a small central ulcer due to radium over-dosage. Such an ulcer can be easily treated after its margins are definitely established and the boundary between the damaged and healthy tissues easily seen. Removal of the ulcer crater by diathermy to a depth of a few millimetres is rapidly followed by the growth of epithelium.

I have already referred to the advisability of packing the tongue away from the jaw in cases in which much radium is disposed on the lateral margin of the tongue. The use of lead for such a purpose is sometimes advised, but in any practicable thickness it is of very little use—for example, if 5 mm. of lead is used the reduction of the hard gamma rays is less than 25 per cent.[9] In addition, the lead, under the influence of the transmitted gamma radiation, emits a very caustic radiation at the surface in contact with the jaw. It is far better when protection is sought to rely on distance, and to use in the case of the tongue, for example, a hollow vulcanite box fixed to the teeth or jaw. The increased distance from the radioactive source thus obtained will diminish sufficiently the intensity of the radiation, while the elements of light atomic weight forming the black vulcanite will not themselves be a source of harmful radiation.

Radiation by Roentgen Rays

Another method of irradiating the tongue is by Roentgen rays. Up to the present their application has been technically difficult, and radiation by the ordinary Roentgen-ray tube would hardly be attempted save in cases where radium treatment was impracticable. Dufour and Cottenot[10] describe a case where some temporary

improvement resulted, and I have personally treated two patients with large fixed tongues and large bilateral adenopathy in whom there was a marked palliation of symptoms, though this was merely temporary.

In recent years Chaoul of Berlin,[11] struck by the results obtained with radium in growths of small extent, and from a consideration of the physical principles involved, has employed a Roentgen-ray tube operated at a very short distance from the part treated. In general the use of radium at very short distances from a tumour has been regarded as disadvantageous. This disadvantage arises principally from the difficulty of securing homogeneous radiation. In using Roentgen rays at extremely short distances Chaoul has reproduced one feature of gamma radiation—namely, that the total amount of radiation absorbed in the tissues is much less than in ordinary Roentgen radiation. Later Chaoul[12] reported 103 cases, of which ninety-three were symptom-free for one year or more. As only half these cases were of skin carcinomata, and cases of cancer of the tongue were included, the method appeared to be one of promise. The technique employed[13] would seem to be the giving of a daily dose of about 400 *r* for about twenty days to a very small field, at most two inches square. The conditions under which this dose is administered are 150 *r*/min., kV 60, filtration 0.5 Cu, half-wave rectification. The method is well worthy of investigation, but so far as the tongue is concerned the question is one of access. At present apparatus for this method, consisting of specially adapted applicators attached to shock-proof Roentgen tubes with unipolar grounding, is made only in one European country, but it should be inexpensive and simple to manufacture, and if the demand arises should be capable of production by any manufacturer. It is to be noted that the dosage given by this method follows Coutard's system, in so far as it employs a multiple daily split dose. It differs from his in the use of a relatively high intensity (*r*/min.).

The method in principle has one advantage over interstitial or radium puncture radiation. The tumour is not injured as it is by the insertion of radium needles. This insertion must introduce a definite risk of increased metastases. For example, the use of ten needles each an inch long means ten inches of punctured wound in the tumour, or a raw surface of an area perhaps of nearly one square centimetre. The total dosage is quite high, and compares with that given by interstitial radium, stated by Martin and Quimby (quoted by Quick[14]) to be 7 to 10 E.D. for epidermoid cancer and 3 to 5 E.D. for anaplastic types.

Radiation in Gland Areas

The question of treatment where the glands are involved remains one of difficulty. There is a marked decrease in the survival rate in such cases. Several methods are available: ablation, radium implantation, Roentgen radiation, and radiation from a distance, either short with multiple sources on an appliance, or long as with beam therapy (telecurietherapy). The first, if thorough, is as good a method as any. It suffers, however, from a fairly heavy operative mortality rate. Radium implantation can be done either through the intact skin or after operative exposure. The former appears somewhat inexact, even if not hazardous, but it is recommended by Cade[15] if the glands cannot be palpated. Often exposure and consequent implantation of radioactive sources permit a more exact distribution, and therefore a more uniform intensity, but by reason of space considerations and the shape of the gland-bearing areas uniform radiation by means of implanted sources is not easily accomplished.

Radiation from sources disposed on appliances made in the form of a collar of Columbia wax, or of nidrose, or of stent[16] allows more uniform intensity of radiation—still does radiating by beam from a single source at a greater distance—than it is possible to use in the case of appliances worn by the patient. In both these cases the skin presents the limiting factor in the dosage possible. Finally, in Roentgen radiation of the gland-bearing areas, the limitation imposed by the skin toleration, even with prolonged fractional radiation of low intensity, prevents in many cases dosage being given in sufficient amount to eradicate the malignant tissue.

Results of Radiation Treatment

The results of radiation treatment in cases of carcinoma of the tongue are from some aspects very satisfactory and from others much less so. In the first place, in all cases severe mutilation is avoided and great palliation, at least of distressing symptoms, is obtained. We have no figures as yet in Egypt either of the incidence of lingual carcinoma or of survival rates after operation. With radium implantation of the primary growth, and *x*-irradiation in most cases of the gland areas I have treated thirty-two cases since 1929. Economic reasons bring patients to us very late and prevent their regular attendance, but an attempt has been made in every case to trace the patient through the civil administrative authorities, and this has been successful in twenty-one instances. Of these twenty-one patients eighteen are known to be dead; three are living and apparently free of their disease.

According to Cade,[15] healing of the primary lesion is obtained in the majority of cases (74 per cent.). As against this, in the cases where the disease has ceased to be local, this author in 1930 claimed 11 per cent. of five-year, 26 per cent. of three-year, and 48 per cent. of two-year periods in which the patients remained symptom-free. Pfahler and Vastine[17] claim an absolute three-year period of freedom from symptoms in 29 per cent. Rose and Phillips[18] claim 33 per cent. remaining symptom-free for two years. Raven[19] gives 26.6 per cent. surviving three years after treatment with radium and surgery, as compared with 6.8 per cent. with radium only and 19.7 per cent. with surgery only. He states that eight patients treated with *x* rays only were all dead, though obviously such patients would not be of a type suitable for radium or surgery. On the other hand, H. E. Martin[20] reports a patient well after twelve years. Berven,[21] for the years 1922–6, reports 32 per cent. of cases of lingual carcinoma symptom-free after five years, and similar figures are published by the Fondation Curie.[22] These figures contrast with those quoted by Gask,[23] who is of the opinion that the best survival rate to be expected from surgery alone is 20 to 25 per cent.

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AN ORTHOPAEDIC OPERATION FOR CLEFT PALATE

BY

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Two years ago I designed for the first time a cleft palate operation that satisfied me theoretically. My experiences with it since may be worth recording. I had never been able to see this problem as other than an orthopaedic one, on the line of reasoning that the object of operating is to give the patient control of the passage between the nose and the mouth, that this control is by voluntary muscles, and that these muscles should be treated on the relevant principles of the branch of surgery concerned with such structures.

The first step along this very unpopular approach to the operation was to find out how the nasopharynx is normally closed. After a good deal of reasoning and experiment I worked out a complicated scheme of muscular action. Very shortly, it was that the passage is closed by the action of two overlapping " slings " of muscle (Fig. 1). The posterior sling is the superior constrictor,

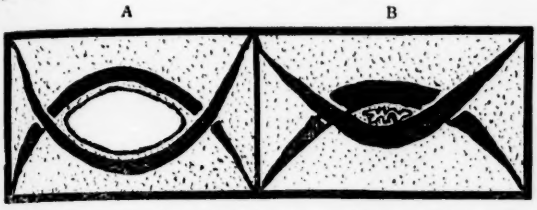

FIG. 1.—Showing how the levator palati and the superior constrictor, acting as two overlapping slings, can close the wide nasopharynx without an abnormal amount of contraction. To close a similar passage by a simple ring sphincter would need a power of shortening far beyond anything shown by voluntary muscle elsewhere.

and its action is helped by the simultaneous contraction of the palatopharyngeus pulling it up into a projecting ruck that is well known as Passavant's ridge. The anterior sling is the levator palati, and it has acting in opposition to it the tensor palati, the only muscle in this region with a nerve supply other than the pharyngeal plexus.

So far as I know, this scheme is the only one that fulfils the following conditions, which seem to be unavoidable.

1. It should correspond with what can be seen on looking through the mouth at a normal palate when the nasopharynx is open or shut. This cuts out all the diagrams in books of voice production.

2. It should correspond with what is seen and felt in a patient gagging under an anaesthetic. I assume throughout that the mechanism is the same whatever the degree or purpose of the closure, whether the tight screwing up of gagging and vomiting, the less tight closure of swallowing, the accurate partial closure of singing, or the light momentary touching of the walls in speech.

3. It should correspond with the behaviour of a catheter lying in the nasopharynx during the act of swallowing and speech. Many anaesthetists must have observed the working out of their endotracheal tubes if the patient is allowed to gag, the reason being that the sphincter rises as it contracts and so thrusts upwards anything it is gripping. I could find no support in the behaviour of such a tube for Wardill's statement that Passavant's ridge remains erect continuously during the time speech lasts, with the soft palate playing upon it.

4. It should close the passage without assuming a quite abnormal variation in length of voluntary muscle. This cuts out Dorrance's account of a simple sphincter, unless the muscle composing it can shorten in contraction to about a quarter of its length in relaxation.

5. It should bring into action all the muscles in this region, which can have no other function than the control of the nasopharynx.

6. There should be some mechanism of opposition to the closure to give the accuracy and rigidity demanded in certain vocal tricks. The nerve supply of the muscles concerned should correspond to this opposition.

Well-known Operations for Cleft Palate

It is hardly necessary to point out that once I had adopted these views, whether they were wright or wrong, obvious objections appeared against all the operations for cleft palate. The classic Langenbeck operation ignored the muscles. Even as performed by such a master as Sir James Berry it gave a large number of failures of union, and at the best only produced a palate the use of which had to be laboriously learnt (probably by an abnormal development of the posterior half of the sphincter). Brophy's operation appeared to me to be a gross mutilation of the whole dental arch for a purpose than could be easily attained in a harmless way. There is never any difficulty in closing a gap in the hard palate if what I would call the " reversed Langenbeck " procedure of sliding the flaps upwards, instead of swinging them downwards, is used. Lane's operation remains a complete puzzle to me. I have never heard of a good functional result from it, and I do not see how one could be attained.

Veau's excellent suggestion of giving the nasal surface of the palate an epithelial lining I have come to think of great importance. But his " suture musculaire " is liable to cut out even when inserted by himself, and it does not control those muscles which I consider the important ones. Gillies's operation was not nearly ambitious enough. I wanted better results than speech with the aid of a plate needing extremely skilled dental assistance to fit. Besides this, most of my patients were young, and the idea of trying to induce a child of 2 years to start on a succession of plates was too much for me.

Wardill's pharyngoplasty, by which he substitutes for the loose and actively rising posterior half of the sphincter a tight mass of scar tissue which drags the sides of the nasopharynx together, appeared to me to go against orthopaedic principles. Apart from my reluctance to destroy the only normal part of the mechanism I was trying to get to work, I had learnt to distrust the permanence of these draggings together and fixations by fibrous tissue. There was also the question of spoiling the drainage of the middle ear by pulling on the Eustachian tube. Dorrance's " push-back " operation was a most reasonable proceeding, but only applicable to a few cases. Like the two preceding techniques, it might be extremely useful where the primary operation had failed to give proper closure.

General Principles of Author's Technique

After a certain number of experiments I adopted a procedure which combined many borrowed points and a few original ones into an operation that was less unsatisfactory than any I had tried before. It turned mainly upon the deliberate freeing of the two separated ends of the sphincter, complete with nerve and blood supply, and their suturing in a plane closer than normal to the posterior wall. I had learnt from watching Mr. O. L. Addison that the wide gaps left in the process of freeing the palate would close with amazing rapidity and very little contracture. The horror with which these are regarded by the plastic surgeon, who knows what penalties would have to be paid if similar chasms were left on the outer surface of the body, is quite unjustified.

The results were satisfactory up to a point. There was one run of twenty successive complete primary healings, and most of the resulting palates moved freely. But I

still had occasional exasperating failures of union, and I still had to warn parents that there would be no automatic improvement in speech after the operation. Something was needed to correspond to that " tension bridge," or modified Logan's bow, by which I had got over two hundred successive primary healings in all varieties of hare-lip. That is to say, a device which would fulfil the two principles of surgery that I was conscious of neglecting ; the first being the removal of all tension from the sutures which actually joined the gap, and the second the leaving of the joined sphincter in the completely shut position. This latter was the really important point. No one would suture a ruptured quadriceps or tendo Achillis without leaving the limb so that the joined muscle lay in the position of contraction during healing. Yet I was leaving my newly constructed ring of muscle much nearer to full extension than full contraction. (The opposing mechanism to the sphincter is so much less important that it can be ignored.) When I saw my present solution to the problem it was simple enough: merely to treat the nasopharynx as one would the mouth of a sack that one wanted to keep shut, and tie a string round it. A ring suture of this sort would be very unlikely to cut out, as the pressure on it would be fairly evenly distributed over its entire length. It took me some time, however, to work out the method ; and, as usually happens with new procedures, the first forms were too complicated.

Points in Technique

LIGHTING

Scialytic operating light plus a 6-volt Winchester parabolic reflector headlight, on a special mounting, with new bulb and batteries for each operating session. Real brilliancy of illumination at the back of the throat is absolutely necessary.

ANAESTHETIC

Intratracheal gas and oxygen for choice ; otherwise oxygen and ether through a weighted tube. The anaesthesia should be too light rather than too deep ; I like to hear the patients talking as they leave the table. Personally I should be terrified of chloroform for this operation.

INSTRUMENTS

I use no special instruments at all, tackling the technical problems that arise in the throat exactly as I would similar ones elsewhere in the body. I have no ambition to change other people's ways of working, but the insertion of the circular suture is beyond the resources of ordinary surgical technique, and for this reason it may be worth describing an individual method. The needle used is spear-pointed to give piercing power without dangerous cutting edges, and curved to the greatest degree that it is possible to sew with, eleven-sixteenths of a circle—the only shape besides a straight one that I have ever been able to see any use for. It is flattened all along its length so that it can be held anywhere by a needle-holder. (Incidentally it is an amusing sidelight on modern surgical methods that all eyeless needles are made round, so that the curved ones swivel in a needle-holder. I have had to have flattened ones specially made.)

The needle-holder is a " pistol-grip " one, the only type I know that fulfils the three requirements of being as firmly held when open as when shut, of having a catch that is safe but can be released by a touch whatever its position, and of pointing along the axis of the forearm so that curved needles can be inserted by simple pronation and supination. A still more important instrument is what I call a " needle-catcher," built like a light toothed artery forceps without a catch. It is held in the " reversed position," pointing down like the ordinary dissecting forceps. (Again it may be noted that there is no term in common use to describe the difference between the way an actor holds a dagger, pointing downwards, and the way in which it is held by those who use it for business purposes, pointing upwards.) Its justification is that it gives a grip by which a needle can be extracted by the point, something quite impossible with dissecting forceps. To insert such stitches as the one needed, the threaded needle is held with its point protruding directly forward in the axis of the holder ; the point is inserted, the catch released, and then the needle is shuffled onwards by alternate grips with the two instruments until it has taken a full bite of tissue and its point returns to view again. This takes some practice, but I do not know any other way in which such a stitch can be inserted except by an automatic device like the " boomerang " needle.

OPERATION

There is first the preliminary one of removing the tonsils and cutting the posterior palatine arteries, as described in my first paper. At least three months afterwards the final stage is performed. The freeing incision

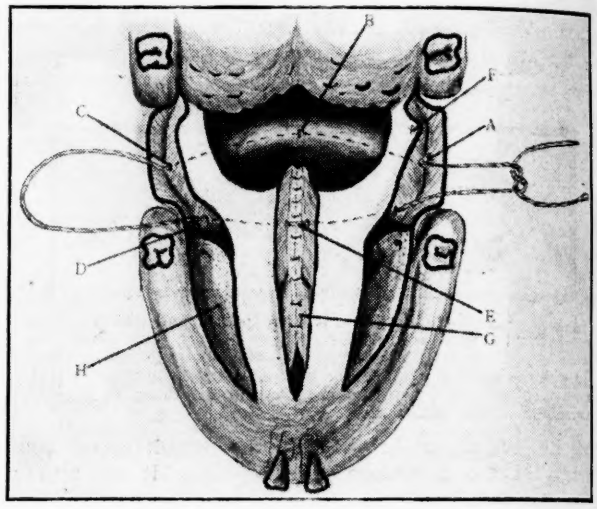

Fig. 2. Insertion of the ring suture.—A, Point of entry of suture, at bottom of right relaxation incision. B, Point of first emergence of needle, and of its reinsertion for the second stitch. C, Point of emergence of suture after crossing the back of the throat. D, Point of insertion of suture into partially sutured soft palate. E, Suture crossing partially sutured cleft ; the nasal mucosa alone has been joined. F, Mucosa of anterior pillar, shrunken up from its original pointed form after being detached from the tongue. G, Mucosa of floor of nose freed and sutured. H, Exposed bone of hard palate. In actual practice it is, of course, impossible to get this view, as the mouth cannot be opened so far. In consequence the surgeon cannot see the line of insertion of the suture across the back of the throat once the gap in the soft palate has been closed.

runs from the canine tooth in front backwards just inside the teeth, then along the line of the pterygomandibular raphe, cuts the anterior pillar of the fauces off the tongue, and ends in the middle of the empty tonsillar fossa. Through this, by forcible blunt dissection controlled by a finger at the point of the instrument, the muco-periosteum of the hard palate, the mucosa of the floor of the nose, and the whole side of the nasopharynx (taking with it the hamular process) are freed so that they fall inwards and backwards towards the posterior wall. It looks, I admit, a severe proceeding, but nothing of any importance is divided, it can be very rapidly done, and the bleeding is not great.

Then from the bottom of the incision that frees the soft palate a double suture of forty-day No. 1 chromic catgut is passed right round the back of the throat in the way described. It enters the tissues opposite the tip of the uvula, emerges in the middle of the posterior wall of the pharynx, is reinserted through the same puncture, and emerges again through the corresponding point to its insertion on the opposite side. Occasionally I cannot get

all the way round in two bites of the needle, and have to take three. The stitch should run behind the superior constrictor exactly in the line of Passavant's ridge, and the test of correct insertion is that the action of this posterior part of the sphincter can be exactly imitated by pulling upon the catgut and rucking up the back of the throat. The tendency of the inexperienced is to insert it too high, in the adenoid bed, which is friable and adherent.

The ends of this suture are left hanging out of either side of the mouth, and the edges of the soft palate are deeply split by a sharp-pointed No. 11 Bard-Parker blade. This split continues backwards the gap between the muco-periosteum of the hard palate and the nasal mucosa, and runs, gradually diminishing in depth, to the tip of the uvula. I think it is a grave mistake to cut loose the soft palate from the palate bone and the nasal mucosa, as is so frequently advised. The continuous nasal surface of soft and hard palate is then joined by interrupted sutures, plain ones for the nasal mucosa and vertical mattress ones for the soft palate. I have lately been using 40-day No. 000 chromic catgut for this, and I think that if carefully tied in a treble knot it is probably better than the ophthalmic silkworm-gut I used before.

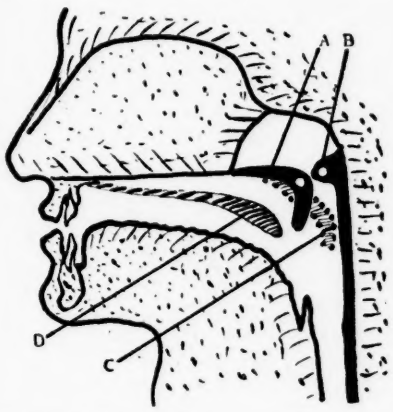

FIG. 3. Closure of the nasopharynx.—A, The soft palate in the position of closure, showing a depression in its centre opposite the level of closure, and the uvula well away from the posterior wall. A white dot shows the position of the ring suture when finally tied. B, Passavant's ridge, with a white dot showing position of the ring suture. C, The position of the soft palate when closing the nasopharynx, as given in text-books. It corresponds to the general notion of its action as that of a flap-valve, rather like a cardiac one. D, The position of the palate after a classic Langenbeck operation. The muco-periosteum of the hard palate has been swung downwards to meet in the mid-line, and the soft palate is shortened by being stretched from side to side.

Then the ring suture is passed through the substance of the soft palate, just in front of the insertion of the tendon of the tensor palati, crossing the half-sutured gap in the middle, and returning to its original insertion in a complete circle round the line of the sphincter. It is left untied (Fig. 2). The oral surface of the soft palate and the mucoperiosteum of the hard palate are then joined by vertical mattress sutures, and any tiny gaps in the epithelial junction carefully closed. The soft palate thus constructed should lie very much closer to the posterior wall of the pharynx than normal, in contrast to that formed by Langenbeck's method, which lies distinctly further away (Fig. 3). The test of its proper construction is to make the patient gag, when the new mechanism should be seen to work properly at the first time of asking, shutting the throat completely.

The ring suture is then tied, the intratracheal catheter being first withdrawn. Its two loops, which are used in case one should break or be injured, are tied separately with several knots, tight enough to close the passage completely. When this is done the soft palate lies closer still to the posterior wall, the uvula often touching it, and the edges of the cleft can be seen to be jammed together quite independently of the stitches that adjust them. The whole area is cleaned and smeared with 1 in 1,000 flavine in paraffin, which may have an antiseptic and waterproofing effect, and the operation is complete.

AFTER-TREATMENT

This is very simple. The ring suture does not cause any obstruction to breathing through the mouth, so there is no necessity for the precautions advised after pharyngoplasty, though the patients snore for the first week or two. I have no qualms about getting them to open their mouths any time after operation, and often make them demonstrate the action of the new sphincter by saying " Ah " while the stitches are still in position. If non-absorbable sutures have been used any remaining ones can be removed a fortnight after operation.

The palates usually stiffen considerably from inflammatory infiltration during the first month, and then slowly become more mobile again, till in six months they are thin and thoroughly supple. Whether speech instruction should be begun immediately after operation is a question upon which I have no strong opinions.

Results of Treatment

I have used this suture for nearly two years on more than seventy cases. All the patients were over 18 months of age, but otherwise they were completely unselected, none being refused on account of size of cleft, weakness of physique, or damage done at previous operation. (Some fourteen had undergone one or more previous attempts.) These cases fall into two divisions. On the first twenty I used the more complicated and difficult technique which I described in a preliminary paper. Two patients developed temporary gaps, which healed in a few months. One other patient died of multiple lung abscesses three weeks after operation ; there was no infection of the wound, and this is my only death in over two hundred cases in which I have used the wide incisions. The remainder all healed by first intention.

In the second division, that in which I used the technique outlined in this paper, the first fifty-two cases all healed completely by first intention. The fifty-third developed a small hole at the junction of hard and soft palates of the type that invariably heals spontaneously (Veau's " trou temporaire "). I have also seen several excellent results produced by my juniors with this method.

But far more important than the percentage of healing are the functional results, and these really seem to me more satisfactory than any I have seen before. At any rate, they are the first in which I have got spontaneous remarks on the improvement in speech from the friends or parents of nearly every patient. The palates also have a distinctive look: they lie close to the back wall of the pharynx, and when the patient says " Ah " they can be seen to go up smartly into a central dimple, just as in the normal throat. This is quite different from the movement of the mobile palates I had previously obtained ; they moved all in one piece. It is too early yet, of course, to dogmatize about results: my younger cases are still in the baby-talk stage, and most of the older ones have to get out of bad habits of speech. And it is not an operation for anyone who is not prepared to study the anatomy and practise the technique before attempting it.

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MANDELIC ACID IN THE TREATMENT OF URINARY INFECTIONS

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Since the introduction of the ketogenic diet treatment of urinary infections by Clark[1] and Helmholz[2] in 1931 there has been ample proof of its efficacy. While many workers have been convinced of its remarkable bacteriostatic power they have, however, been hardly less impressed by the practical difficulty of carrying out the treatment.

The ketogenic diet lacks universality of application, owing to the necessity for rigid and skilled dietetic supervision, and owing to its nauseating and expensive character.

The bacteriostatic agent in the urine of patients under ketogenic treatment has been shown by Fuller[3] to be β-hydroxybutyric acid. Little or no effect, however, is produced on urinary infection by the oral administration of this acid, since when given in this way it is completely oxidized before reaching the urine. Attempts have therefore been made to find a related non-toxic acid which would exert a similar bacteriostatic effect, but which would not be oxidized when given by the mouth, and which would be excreted unchanged in the urine. It has recently been claimed by Rosenheim[4] that mandelic acid ($C_6H_5.CHOH.COOH$) fulfils these requirements, and that when 12 grams are given daily in divided doses and the urine rendered strongly acid by ammonium chloride, it forms an effective substitute for the more cumbersome ketogenic diet treatment.

* In receipt of part-time grant from the Medical Research Council.

Report on Sixteen Cases

The following is a report on sixteen cases of urinary infection treated with mandelic acid. The drug was given, as advised by Rosenheim, in the form of the sodium salt in a neutral mixture, according to the following prescription:

℞ Mandelic acid ... ... gr. 45
Sod. bicarb. ... ... gr. 21
Syr. aurantii ... ... ʒ j
Aq. ... ... to ʒ j

Sig.: ʒ j ex. aq. four times a day.

Appropriate doses of ammonium chloride were given to maintain a urinary *p*H below 5.5. This drug was given in cachets containing 10 grains. Six cachets in the day were usually sufficient to secure the desired acidity, though larger doses were sometimes necessary. The fluid intake was limited to between two and three pints a day, to ensure a strong concentration of the mandelic acid in the urine.

The varying types of case treated and the results obtained are shown in the accompanying table.

Case	Sex	Age	Infection	Duration of Infection	Diagnosis	Days Till Urine Sterile	Minimum *p*H Attained	Side Effects	Remarks
1	F	37	B. coli	8 years	Chronic pyelitis	8	—	Nil	Cure
2	F	43	„	7 years	„	8	—	A few casts; trace albumin	Cure
3	F	58	B. coli; Strep. faecalis	5 years	Chronic cystitis	Not sterile	5.0	Nil	Left hospital after 8 days treatment. Much improved
4	F	14	B. coli	1 year	Chronic pyelitis	12	5.4	Nil	Cure
5	M	67	B. coli; streps; staphs	1 year	Chronic cystitis	Not sterile	5.3	Nausea; vomiting; dysuria	Failure. Treatment stopped after 12 days, owing to side effects
6	F	60	B. coli; Strep. faecalis; diphtheroids	4 months	„	6	4.8	Trace albumin; a few casts	Cure
7	M	66	B. proteus; staphs; streps	4 months	„	Not sterile	7.8	Acidosis; nausea; vomiting	Failure to produce an acid urine. Not improved
8	M	72	B. coli	3 months	„	8	4.9	Buzzing in ears	Cure
9	M	28	T.B.; B. coli; staphs	3 months	Tb. bladder	8	5.4	R.B.Cs.; indigestion; buzzing in ears	Cure of secondary infection only
10	F	39	Staphs; T.B.; B. coli	3 months	„	10	—	R.B.Cs.	Cure of secondary infection only
11	M	22	B. coli; staphs; diphtheroids	3 months	Subacute cystitis	10	5.2	Giddiness; a few casts	Cure. Relapse in a week. Cure of relapse in a week
12	M	47	B. coli	7 months	„	6	5.0	Nil	Cure
13	F	63	„	4 weeks	„	8	5.2	Giddiness; buzzing in ears	Cure. Relapse in 3 months Cure of relapse in 5 days
14	F	56	„	16 days	Acute cystitis	10	5.1	Nil	Cure
15	F	53	„	7 days	Acute pyelitis	5	5.0	Nil	Cure. Relapse in 1 month
16	F	73	„	7 days	„	5	5.4	Nil	Cure. Relapse in 2 days Cure of relapse in 1 week

Cases 1 to 5 comprised very chronic types of urinary infection, in which the condition had been present for from one to eight years. They had all been previously subjected to a great variety of medicinal, and in some cases, local treatment, to which they had proved entirely recalcitrant, with the exception of Case 4, who had responded satisfactorily to the ketogenic diet but had relapsed shortly after it was discontinued. Cases 6 to 10 were also chronic cases, though giving a somewhat shorter history, which had also proved recalcitrant to treatment. In this group Cases 9 and 10 were suffering from genito-urinary tuberculosis, complicated by a secondary infection. The treatment was directed to the eradication of this latter, without, of course, any expectation of influencing the underlying tuberculous disease. Cases 11 to 16 were more acute types of disease, which had failed to clear up under ordinary massive alkali therapy. It is true that in the last two cases this had only been given a short, and possibly inadequate, trial, but Case 16 was getting rapidly worse in spite of thorough alkalization, and was desperately ill when mandelic acid treatment was started.

Cases 1, 3, 5, 7, 9, 10, 11, and 12 had the diagnosis confirmed by cystoscopic examination.

The type of infection found in each case is shown in the table. As was to be expected, the coliform bacillus was predominant, but in seven of the cases a mixed infection was present. Repeated bacteriological examinations of catheter specimens by cultural methods were made in all cases.

The initial *p*H of the urine before treatment is omitted from the table, as it was very frequently artificially raised owing to the fact that the patient had been taking alkalis previously. It will be seen that, with the exception of one case, a minimum urinary *p*H of below 5.5 was always procured, and this effect was usually obtained by the daily administration of as little as 60 grains of ammonium chloride. Less than this was never given, and in a few cases a larger dose was necessary. Case 7, however, resisted all efforts to acidify the urine. This patient, after prostatectomy, developed a mixed infection of the prostatic bed, with *B. proteus*, streptococci, and staphylococci. He had suffered from marked frequency, dysuria, and slight incontinence for a year, and had resisted all local and medicinal treatment. His urine was found to be highly alkaline (*p*H 8.4) owing to ammoniacal decomposition in the bladder. As much as 360 grains a day of ammonium chloride was given to this patient, and when this failed to acidify the urine a similar quantity of calcium chloride, combined with bladder wash-outs, was tried. These measures produced a true acidosis, as indicated by a CO_2-combining power of the blood of 45 volumes per cent., and some nausea and vomiting, but in spite of this the urine remained persistently alkaline, the *p*H never falling below 7.8.

General Commentary

It will be seen that, with three exceptions, the treatment was successful in sterilizing the urine. This result was brought about with remarkable rapidity, when the chronic and intractable nature of many of the cases is considered. The effects produced in this series of patients were even more rapid than those recorded by Rosenheim,[4] who quotes ten to twenty-one days as being the usual time to elapse before sterilization of the urine is complete. It is true that four of the cases relapsed, two almost immediately after treatment was discontinued, one within a month, and one within three months. In Cases 11, 13, and 16, however, the relapse was successfully treated with mandelic acid, the urine again becoming sterile within a few days. In Case 15 it was not possible to treat the relapse, the patient having left the district. Since no patient has been under observation for longer than five months it is probably too early to regard the successful results as complete cures. In view of the relapses it would seem wiser not to discontinue the treatment immediately the urine has become sterile, and possibly to give further courses to prevent recurrence.

The treatment failed in Case 7. As has been said, it was found impossible to render this patient's urine even mildly acid, and the failure can probably be ascribed to this fact, since mandelic acid is only effective in a strongly acid urine. It was also completely ineffective, after twelve days' trial, in Case 5. This patient suffered from dyspepsia, and nausea and vomiting resulted from the treatment. He also complained of increased dysuria. These symptoms necessitated the abandonment of the treatment. Case 3 had to leave hospital owing to domestic difficulties after she had taken mandelic acid for only eight days. Though the infection was greatly improved, complete sterilization of the urine had not been obtained by this time. In spite of this her symptoms of frequency and dysuria had completely disappeared for the first time for five years, and she felt very much better. On her last day in hospital she passed urine only four times in twenty-four hours. Previous to treatment the average daily frequency, even while at rest in hospital, had been twelve.

A striking feature of the treatment, indeed, was its effect in diminishing the frequency of micturition and the dysuria from which the majority of the patients suffered. The amelioration of symptoms was usually manifest in the first few days of treatment, before the urine had become sterile. This effect was not observed in Case 5, where the dysuria actually increased, nor in Cases 9 and 10, who suffered from tuberculous ulceration of the bladder, and whose symptoms remained very much the same in spite of the disappearance of the secondary infection. In these two latter cases, however, it was surprising that no increased dysuria resulted from the highly acid urine.

With the exception of Case 5, already referred to, and Case 7, where massive doses of ammonium and calcium chloride caused an acidosis, only trivial side effects were observed. Four of the cases, while being treated, complained of very slight giddiness, lightness in the head, and buzzing in the ears. A slightly increased albumin excretion and a few granular casts made their appearance during the period of acid therapy in two of the cases, and a definitely increased haematuria occurred in both cases of tuberculous ulceration of the bladder, one of whom also complained of mild indigestion. These effects, which are similar to those noted by Rosenheim,[4] all rapidly subsided on withdrawal of the drugs.

The nauseating effects of ammonium chloride are well known, and it is not surprising that even in doses of 60 to 120 grains a day it should sometimes produce mild digestive disturbances, especially in those already dyspeptic. We[5 6] have already drawn attention to the deleterious effects of acids and acid ash diets on the kidney function of patients suffering from chronic interstitial nephritis. It would appear wise, therefore, not to persevere with this treatment for a long period of time, especially in patients suffering from renal impairment, or in those in whom albumin and casts make their appearance while under treatment.

The CO_2-combining power of the blood was noted before and after treatment in a number of cases in this series, but apart from Case 7, where it fell from 63 to 46 volumes per cent., no very significant changes occurred, a mild reduction of the alkali reserve, within the limits of normal, being all that took place.

Conclusion

The treatment of severe chronic urinary infections has hitherto been notoriously unsuccessful in spite of the large number of antiseptics available. The very multiplicity of such preparations on the market, indeed, speaks for their inefficacy. Our results would seem to suggest that in mandelic acid a really efficient urinary antiseptic has been found, confirming the original claims made for the drug by Rosenheim. If this is so, this simple and practical treatment forms a really important therapeutic advance in the attack on a very common and disabling condition.

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PREVENTION OF SEVERE REACTIONS IN THE GOLD TREATMENT OF RHEUMATOID ARTHRITIS

BY

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In view of the widespread use of the injection of gold salts for the treatment of rheumatoid arthritis I thought that my own experiences in attempting to prevent the skin reactions which so frequently bring this valuable treatment to a premature end might prove interesting.

In 1934 C. Mayer[1] published a paper describing his technique for the administration of gold to tuberculous patients at the Laennec Hospital in Paris. His method, although varying according to the initial state of the patient and the early responses to this mode of treatment, is, broadly, as follows.

A first injection of 0.1 gram crisalbine in 5 c.cm. of distilled water is given, and a week later 0.15 gram is used; the dose is then increased to 0.25 gram, which is also given in 5 c.cm. of distilled water, and ordinarily this dose is continued for four months for a single course. If severe reactions of any type occur he uses, instead of distilled water, 10 c.cm. of a 10 per cent. solution of calcium gluconate. If the patient is febrile at the beginning of the treatment he employs the gluconate solution instead of distilled water from the outset. By this method it appears that he has been able to administer gold over very long periods without producing any untoward reactions, even in single doses of as much as 1 gram where this has been necessary.[2]

Encouraged by these results I have tried the method in the gold therapy of rheumatoid arthritis, and I think that it has entirely justified itself. Before adopting it I was unfortunate enough to get skin reactions of greater or lesser degree in as many as one-third of the patients under treatment. In one case a generalized exfoliative dermatitis ensued in a woman of 58 after only 0.15 gram of allochrysine given in three weekly doses of 0.05 gram each. She recovered after intensive sodium thiosulphate treatment, but was very ill for nine weeks. Another woman of 56, who had received a course of allochrysine, amounting in all to 1.95 grams and administered as 0.1 gram doses weekly, with the exception of the first three doses, which were each 0.05 gram, developed a hepatitis six days after receiving the first dose of 0.1 gram of her second course, there having been an interval of two months following the first course.

In neither of these cases was there any evidence of a renal inefficiency, which, if present, might have led one to regard the patients as bad subjects for treatment of this kind. The first case must be regarded as one with a very marked personal idiosyncrasy towards the metal, for so small a quantity as 0.15 gram to have produced such marked toxic manifestations. These were the most severe of the reactions that I encountered during my earlier series of cases, before I used calcium gluconate concurrently with gold salts. The absence of anything other than mild reactions has been very striking in the cases treated since.

Gold Preparation and Dosage Employed

The gold preparation I use is allochrysine, and it is given in doses of 0.1 gram weekly up to a total dosage (for one course) of 1.8 to 2.4 grams, the total dosage being decided on by the alteration in the red cell sedimentation rate, as well as by the clinical condition of the patient. Previous to using calcium gluconate with the gold my first doses were 0.05 gram, and this amount was continued for two or three injections before going on to 0.1 gram. Now, however, I begin with 0.1 gram, and this seems to be quite safe when calcium gluconate is administered as well.

The allochrysine solution is mixed directly with 10 c.cm. of 10 per cent. calcium gluconate, the ampoule of saline solution supplied in the packages of allochrysine being discarded; the injection is then given intramuscularly. Mayer used a preparation known as "gluconyl" for his supply of calcium gluconate, this being already made up as a 10 per cent. solution. A more easily obtainable preparation in this country is one put up by the firm of Sandoz; this is prepared as a 10 per cent. solution sterilized ready for use in 10 c.cm. ampoules. The contents of the allochrysine ampoule mix readily with this.

Results in Sixteen Cases

Since April of this year I have treated sixteen cases of rheumatoid arthritis and one case of polyarticular gonococcal arthritis by this modification of Forestier's method,[3] and in no instance has it been necessary to stop or even to intermit the treatment because of severe reactions. Probably the most instructive case in this series is that of a girl aged 25, who had been suffering for eighteen months from a very active type of rheumatoid arthritis. Her treatment was commenced before I had started the concurrent administration of calcium gluconate, and after receiving 0.4 gram of allochrysine she developed a severe papulo-erythematous rash, most profuse on the limbs, but also marked on the trunk. She felt ill and had to go to bed, where she was treated with sodium thiosulphate. The rash was succeeded by considerable desquamation, and she received no more gold for a month. When her treatment was restarted she was given calcium gluconate as well, and a full course of allochrysine, totalling 2.4 grams, of which 2 grams were administered after the subsidence of the skin reaction, was successfully given without further interruption.

The only reactions I have seen during the administration of gold and calcium gluconate together have been the following: (1) The development of a few itchy papules on the hands and less commonly on the feet. These have occurred in three cases, but they have been ignored and nothing more has happened; the treatment has not been suspended in consequence of their occurrence. They have been followed by a little desquamation of the skin of the hands, and presumably represent an abortive attempt at a skin reaction. One of these cases was that of the girl referred to above, and the papules appeared when she had received 1.4 grams. It is probable that had she not been protected by the calcium gluconate she would have developed another severe skin reaction. (2) A mild stomatitis, not unlike that occurring very rarely as a secondary reaction to nirvanol, but not nearly so severe. These reactions were in subjects who were at the end of their first courses of allochrysine, and so the effect which the further continued administration of gold would have had on the condition can only be speculative. It will be of interest, however, to note whether or not the stomatitis recurs early during their second courses of allochrysine and calcium gluconate.

In conclusion, when I first adopted this method I thought that perhaps the administration of calcium gluconate would neutralize not only the toxic effects of the gold but also its therapeutic effects. This fear, however, does not seem to have been justified, for not only does the clinical condition of the patient improve as with unadulterated gold, but the blood sedimentation rates also return to normal, and this latter test, when used with an appreciation of its limitations, seems to be the most useful index we have of whether or not the disease process is becoming quiescent.

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British Medical Association

CLINICAL AND SCIENTIFIC PROCEEDINGS

BLACKPOOL DIVISION

Psycho-analysis and Psychotherapy

In a British Medical Association Lecture delivered to a largely attended meeting of the Blackpool Division on November 13th, Dr. William Brown, Wilde reader in mental philosophy, University of Oxford, discussed the applications of psychology in medicine. These, he said, must not be considered as restricted to the treatment of psychoneuroses and psychoses; psychological factors and their adjustment were of great importance even in the most physical of illnesses. On the subject of psycho-analysis, Dr. Brown said that he himself was not a Freudian nor a member of the Psycho-analytical Association, but he had employed the Freudian method, not to the exclusion of methods less elaborate and fundamental, for over twenty years, and he could verify in a general way much that Freud had set out.

The Analytical Situation

In methods of analysis as now practised the patient lay passive on the couch, ordinarily out of sight of the analyst, and was encouraged to talk out the things that came into his mind. From time to time resistances made their appearance, and the patient might find difficulty in communicating; it was then for the physician gently to urge him to continue. In this situation, with the critical faculty suspended, mental tendencies below the threshold of consciousness had an opportunity to show themselves. Ordinarily they were repressed by what in Freudian terminology was called the "super-ego"—an earlier name for it was the "censorship"—but they tended to appear, though in a disguised form, when the mind was weakened through general disease or mental shock or conflict; they were evident also in the dream state, again disguised, when the super-ego relaxed its vigilance. By persuasion and reasonableness these repressed tendencies were driven back to their lair, but they remained unsatisfied, returning at the first opportunity. The scientific psychological treatment was to give these unconscious tendencies a chance to come up into consciousness under the special conditions of analysis, when they would have the opportunity of sublimation and the direction of their energy to higher social and cultural ends.

The physician conducting an analysis, said Dr. Brown, must be prepared to be temporarily a mother-substitute or father-substitute, or both, in relation to his patient. He was a sort of lay figure for the trying on of all sorts of dresses. During this process of transference it was very important that he should not allow himself to be caught up into counter-transference, and he must not mind the vagarious attitude of the patient towards him. To fill this role the analyst must first be analysed himself. Much could be done by self-analysis, but if this was to be conducted to any effect it must be preceded by analysis from someone else. The ideal was for the physician to be free from complexes, his mind like a mirror, without flaw or distortion.

Treatment by Suggestion

Psycho-analysis was a process within the wider field of psychotherapy. The counsel of perfection was a long Freudian analysis, lasting perhaps a hundred hours or more, but many patients could not afford the time for such lengthy treatment, and there were short cuts in the way of suggestion treatment which were effective in many cases. It was possible to help these patients not so much by advice as by instruction in the deeper philosophy of living, and here the lecturer deplored the uncompromising attitude of Freud in regard to religion, though he admitted that in deep analysis great care had to be exercised in invoking religion lest the unconscious primitive sense of guilt be intensified. But in this treatment, which stopped short of the long Freudian analysis, the patients were encouraged to talk out their lives and to get a clearer view of the situation at the conscious level. The lecturer described the technique by which constructive suggestion treatment might be carried out, the patient's suggestibility being increased by reclining passively, breathing deeply and regularly, and with muscles relaxed and emotions calmed down; suggestions of greater self-confidence were then given to him. He could be instructed also in auto-suggestion, to be practised just before going to sleep. The method of hypnosis might also be employed. Although orthodox Freudians threw up their hands at the idea of suggestion treatment, there was no necessary conflict, in the lecturer's view, between this and the full analysis.

Clinical Memoranda

A Case of Aural Myiasis

Maggot infestation in man is sufficiently rare in Britain, we think, to justify the description of a case which recently occurred in practice.

A farm hand, aged 30, attended surgery on the morning of July 25th, 1935, complaining of acute pain in, and a blood-stained discharge from, the left ear. He stated that while tending horses in the afternoon of July 23rd a fly had entered his left ear, "buzzed about a minute or two," and flew out. During the afternoon of July 24th irritation was felt in the ear. As the day went on this irritation gradually became acutely painful, and prevented sleep during the night of July 24th to 25th. The pain was described as "a burning in the ear." There were blood stains on the pillow in the morning.

On examination no tenderness was elicited over the mastoid nor in front of the ear. The ear was not protruding abnormally. The external auditory meatus was occluded by sero-sanguinous discharge, in which two small white maggots were seen wriggling. The ear was gently syringed with warm water, two maggots being removed. Auroscopic examination now revealed a mass of maggots completely obstructing the meatal canal. Gentle syringing, using a weak solution of dettol (2 drachms to 1 pint of water), which caused the maggots to wriggle vigorously and disimpact themselves, easily removed them. When all were removed the meatal walls and the tympanum were seen to be congested and oedematous. The landmarks of the tympanum were quite obliterated by the swelling, but there did not appear to be any perforation.

Relief from pain was coincident with the removal of the maggots. To combat secondary infection which might develop the patient was instructed to instil the usual spirit and perchloride drops. The following evening, July 26th, the tympanum and meatal epithelium had almost returned to normal, and four days later, except for a slight thickening of the tympanum, there was no evidence of the unpleasant visitation.

In all, thirty-one maggots, measuring 6 to 8 mm. in length and wriggling actively, were removed from the ear. The five best specimens were sent to Dr. John Smart of the Department of Entomology of the British Museum for identification. They were identified as not quite mature larvae of *Lucilia sericata*, or greenbottle, which cause myiasis in sheep.

Aural myiasis is not uncommon in man in South America and South Africa, but so far as we can ascertain no case has been recorded in Britain. Austen[1] in 1912 had no case to report, and since then we can find no British cases in the literature.

A. L. L. Davis[2] records two cases of unidentified aural myiasis in which removal of the maggots was achieved

by using a syringing fluid containing 50 per cent. chloroform. In these cases the maggots were small, about 1 mm. in length, and much more numerous, 190 being found in one case. Perforation of the tympanum had occurred in both cases.

In our opinion the dilute solution of dettol could not be bettered for disimpacting the maggots, and one would imagine it would be less painful on contact with the raw epithelium of the meatus and tympanum ; besides having a powerful antiseptic action it would reduce the danger of infection.

We would like to express our indebtedness to Dr. John Smart for the great help he has given us in identifying the maggots and in supplying references in scientific literature.

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Stansted, Essex. J. A. SCOTT, B.A., M.B., Ch.B.

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"Spontaneous" Rupture of the Spleen

Several cases of delayed haemorrhage from rupture of the spleen following injury of varying grades of severity have been recorded in the past few months, and fewer than fifty such cases are said to be extant in the literature. I believe the following case will be of interest in view of the entire absence of any history of injury.

A British soldier, aged 27, while quietly playing cards at 9 o'clock one evening, felt pain in the upper left abdomen ; the pain soon became generalized, finally settling in the right iliac fossa in the course of a few hours. He vomited twice after the onset of the pain, but did not report sick until 11.30 the next morning, when he was admitted to hospital as a case of acute appendicitis. The patient was transferred to a larger hospital, a distance of twenty-seven miles, for operation. On arrival there, some twenty hours after the onset of the pain, he was found to have stood the journey well ; he complained only of pain in the right lower abdomen. His pulse was 110, temperature 98, respirations 20, and total leucocyte count 13,500 per c.mm. There was tenderness and rigidity in the right iliac fossa, but no tenderness was elicited elsewhere. Per rectum there was tenderness on the right side, and masses of hard faeces were present. An enema gave a good result.

The abdomen was opened by a right gridiron incision. Blood at once escaped from the peritoneal cavity and the appendix was seen to be normal. The caecum was not markedly distended. The appendix was removed, the incision closed, and the abdomen reopened by a right paramedian incision. The spleen on first examination appeared to be normal, but after a fruitless search of the rest of the abdomen a little blood clot came away from the spleen, when a rent could be felt in its capsule about one inch long. The spleen was removed, and the patient made an uneventful recovery.

Examination of the spleen revealed blood clot beneath a wide area of the capsule, and the splenic tissue was also ploughed up by haemorrhage to a considerable extent. In view of the small rent in the capsule these appearances strongly suggested that the latter was torn by pressure due to haemorrhage within the spleen, the capsule being first lifted off that organ, and not separated from it simultaneously with the internal damage, as would most probably occur in trauma. It is, of course, conceivable that trauma might produce subcapsular damage, the capsule eventually giving way as the intrasplenic pressure rose as a result of the subcapsular haemorrhage. But the patient, on close questioning after recovery, was definite that he had sustained no injury of any kind, recent or remote.

Histologically one was at once impressed by the extreme thickening of all the vessels owing to hyaline change. No other sign of disease was found, nor was there any history of previous illness. The Wassermann reaction was negative. The pedicle of the spleen was not twisted: it was too short for this to have happened. I can only suggest that a fairly large and diseased blood vessel had ruptured within the spleen, and consequent upon this the splenic tissue and capsule had ruptured. Exactly why the vessel should burst when the patient was sitting down quietly does not appear.

I am indebted to Lieut.-Colonel H. Stott, I.M.S., professor of pathology, King George's Medical College, Lucknow, and to Major A. Craighead, I.M.S., for the sections and the pathological report upon them.

G. B. THOMAS, F.R.C.S.Ed.,
Peshawar. Captain I.M.S.

Toxic Symptoms Associated with Mandelic Acid Treatment

The following case seems, in view of the current use of mandelic acid in the treatment of urinary infections, to be of sufficient interest to merit publication.

Case Record

A girl, aged 17 years, suffering with *B. coli* cystitis, was placed on mandelic acid treatment as an alternative to the ketogenic diet, which was found objectionable. Three-gram doses of the acid in the form of the sodium salt were given in solution thrice daily, followed by 2 grams of ammonium chloride. For the first eight to nine days of the treatment there were no untoward symptoms, apart from a certain amount of nausea after each dose, which was attributed to the taste of the preparation. On the tenth day complaint was made of aching of the neck muscles. On the eleventh day the aching increased and a severe urticarial rash appeared. Aching of the leg muscles also occurred. On the twelfth day the rash had partly disappeared, but the aching of the neck and leg muscles became more severe, and a relation between the taking of the preparation and the onset of the pain was noticed.

The aching began approximately half an hour after taking the dissolved tablet, and increased in intensity until it reached its maximum in about one and a quarter to one and a half hours, after which it gradually decreased until the next dose, when the symptoms recurred with increased violence. On the thirteenth day the symptoms continued with still greater intensity, and the arm muscles became involved. The leg muscles became so markedly affected and power lost to such an extent that raising of the limbs was almost impossible. The pain also was so intense as to cause the patient to cry out. Vomiting occurred. By this time one was definitely certain of the relation between the onset and acuteness of the attacks and the swallowing of the drug. The treatment was thereupon discontinued, and the symptoms at once began to subside. No further attacks occurred, and within forty-eight hours, apart from utter exhaustion, all was apparently well.

The reflexes were normal throughout. The *p*H of the urine was carefully checked daily. There was no albuminuria.

Discussion

I have sought information as to the possible explanation of the attacks, but have been unable to obtain any help from the authorities on the treatment. I suggest, however, that the following is a possible explanation. Mandelic acid is allied to lactic acid, which occurs in the form of sarcolactic acid in the muscles in cases of muscle exhaustion. Possibly mandelic acid produces in a susceptible person an artificial muscular exhaustion, which results in the symptoms I have described. I should mention that there was a definite improvement in the bladder condition. Whereas before treatment there was a considerable growth of *B. coli* in culture, only a few isolated colonies were grown after discontinuance.

London, W.8. S. CHAPLIN, M.D.

Post-operative Treatment of Congenital Pyloric Stenosis

Since the vast majority of cases of congenital pyloric stenosis are referred to hospital for treatment, the following observations may be of interest from the angle of post-operative treatment at home.

Clinical Record

The infant, a boy of 5 weeks, had been fed on the breast for two weeks; the mother developed an acute mastitis and she was advised that artificial feeding should be instituted. I next saw the child with a history of five days' persistent vomiting. I took him to a nursing home and operated under local anaesthesia (Rammstedt operation). I may say that previous to operation no lump was palpable although visible peristalsis was well marked.

The infant was removed from the nursing home three hours after operation as I was convinced that constant nursing in arms was imperative in these cases, and this desideratum is hardly ever attained in a busy hospital or nursing home. Those that have the child's welfare most at heart are the parents, and they are the ones likely to carry out instructions most rigidly. As the father of the child was unemployed he took turns with his wife to nurse the infant.

Five-ounce feeds of diluted cows' milk with added sugar were given three-hourly, and, if the child cried between feeds, a little sugar and water; this was the same mixture that was given before operation, and I did not see any reason for changing it. At the end of the first day following operation the child's buttocks were quite plump where before they had been hanging in loose folds, and none of the feeds had been vomited; there was one vomit the next day due to mixing a teaspoonful of fluid magnesia with the feed. Vomiting did not recur. About the sixth day the child did not seem satisfied with its feeds, and they were increased to five and a half ounces three-hourly. The weight increased progressively, and I ceased attending the child on the tenth day, when the stitches were removed.

During the post-operative period orange juice was given, and the mother dipped her finger in cod-liver oil and allowed the child to suck it. On the second post-operative day the child was taken out of doors by the mother and continued to go out each day. It is now one month since the operation and the child is healthy and strong.

Conclusions

1. Provided the infant is seen and treated early hospitalization is unnecessary and may be harmful.
2. With the same provisos small and frequent feeds are unnecessarily wearing; normal feeds are tolerated.
3. Constant warmth communicated by the human body is most comforting and essential to the post-operative well-being of the infant.
4. If the infant is kept in hospital, relays of nurses should be detailed to nurse the infant in arms.

Longtown, Cumberland. ROBERT RUTHERFORD, F.R.C.S.

According to H. Jacobi (*Zentralbl. f. Gynäk.*, October 5th, 1935, p. 2364), the physiological dilatation of the ureter due to pregnancy regresses as a rule quickly after labour. When associated with pregnancy pyelitis, though it has the same gross anatomical characters it is accompanied by degenerative changes in the ureteral musculature which cause the dilatation to persist for many months or years. This has been shown by radiological contrast examinations in patients who had previously had severe pyelitis. Although they later suffered from colicky pains in the urinary tract, closely associated with menstruation, they usually had no *B. coli* in the urine, and the tests of renal function gave normal reactions. Jacobi confirms the observations of Haselhorst that more than half the number of patients having pregnancy pyelitis report some persisting pain, while in one-quarter there is a recurrence of the pyelitis in the next pregnancy.

Reviews

CLINICAL LABORATORY METHODS

The full investigation of a patient nowadays involves much more than a clinical examination carried out with an agreeable bedside manner. The student during his training is taught to take his place as one of a team of workers—several of whom are qualified—whose work is often on specialist lines, and whose efforts are co-ordinated by the senior physician of the unit. Even during the tuition stage the work of the ward clerks is differentiated from that of the pathological clerks. Thirty years ago laboratory tests were looked upon with curiosity; to-day every hospital and clinic finds it advisable and necessary to conduct routine and special laboratory tests. More and more are the tests formerly regarded as special being brought into the routine group. Instruction in clinical pathology has become one of the most important branches in the curriculum of the medical school, and it is right that this should be taught or supervised by specialists in the subject. Two difficulties emerge, however, and of them the first is at present that which appears the greater. It is unlikely that the student can carry into his practice the necessary equipment for conducting more than the simplest tests, or that he should have sufficient time to pursue the subject even with available laboratory facilities. In order, therefore, that his patients may have the benefit of modern advances in knowledge, the practitioner must know the general scope of the relevant laboratory methods and must be able to apply the results so obtained. With recent graduates this is possible, but after an interval advances in knowledge make it essential for the practitioner to have recourse to post-graduate instruction or books or both.

Of books on clinical pathology there is no lack, and the numbers increase yearly. They may be grouped roughly into handbooks, specialist books, and library books. Few authors have the knowledge and skill and insight to write a satisfactory handbook, a co-ordinated synopsis with the blooms adequately displayed and the excrescences and redundancies pruned away; fewer still can keep their judgement as successive editions are called for. The standard of the specialist class of books is uniformly high, and some are first-class. Monographs on biochemistry, on haematology, on bacteriology, and on the preparation of macroscopical and microscopical specimens are now available which cover the field of medicine and its ancillary sciences in an exhaustive manner. The difficulty is that they tend to become encyclopaedic; and even with the aid of a good index the practitioner in search of knowledge becomes stuck in a morass, with little indication of which is the best path to pursue. For the trained specialist they are a necessity, to refresh his memory of methods. The third group contains what we may describe as library books or reference books. These detail the methods of examination and then describe the inferences that may be drawn in diagnosis from the results obtained. The forerunner of these books was probably that phenomenal volume of von Leube, mistranslated into English words in the German idiom, which inspired in the practitioners of thirty years ago the whole gamut of emotions from laughter to despair. The genre has improved with the years. A recent one of the kind is written by a Director of Laboratories with a clinical bias.

Dr. GRADWOHL, in his *Clinical Laboratory Methods and Diagnosis*,[1] gives a full account of the methods applicable

[1] *Clinical Laboratory Methods and Diagnosis: A Textbook on Laboratory Procedures with their Interpretation.* By R. B. H. Gradwohl, M.D. London: Henry Kimpton. 1935. (Pp. 1028; 328 Illustrations; 24 coloured plates. 36s. net.)

to analysis of urine, blood, stomach contents, sputum, bacteriological and post-mortem examinations, and the diagnostic inferences that may be made. The section on haematology is the best. The book is bulky and could be improved by omitting many elementary descriptions —for example, those of normal solutions and the use of litmus paper—which should be familiar to any student. The author attempts to cover too much ground, so that none of the sections is sufficiently complete. The biochemical methods are better done in other books, but we have noted only one bad mistake—on page 132 "iodide" should read "iodate" both times. The book is good for general reference and is well indexed. While it has been on the library table of the laboratory it has been referred to many times, and usefully.

AS OTHERS SEE US

The anthology *For and Against Doctors*,[2] compiled by Dr. ROBERT HUTCHISON and Dr. GLADYS M. WAUCHOPE, would have been placed by Charles Lamb amongst the Biblia a-biblia, books which are no books. It is a book to be kept by the bedside to be read during wakeful hours after midnight, piecemeal, not as a whole, not even in gobbets. Thus taken, the reader will gain a knowledge of history, for each extract has attached to it the name and date of the author and where necessary of his translator. The compilers have been careful to follow the advice given by Dr. Routh to Dean Burgon and have verified their quotations, but surely it was Toby Venner who wrote the *Via Recta* in 1628 and not Andrew Boorde, who published his *Breviary of Health* in 1547.

The extracts begin in very early times and end in 1933. The reader will learn from them, what he probably knew before, that the public has never had a high opinion of the medical profession as a whole, though it has admired, and may even have loved, individual practitioners. The gibes and causes of dissatisfaction have changed but little throughout the ages. Pomposity, ignorance, cupidity, and pretentiousness are fastened upon as the main failings. "The Best of Doctors is ripe for hell" was a statement made in the Talmud when Jewish physicians were amongst the most learned and cultured men of their time. The extracts against doctors, as chosen by Dr. Hutchison and Dr. Wauchope, are much more numerous than those in their favour, but the authors end upon a pleasant note when they quote Stephen Paget as saying, "If a doctor's life may not be a divine vocation then no life is a vocation and nothing is divine."

The selections have been made carefully, and are a testimony to the wide reading of the compilers. The book can be highly recommended, for it is no bad thing to see ourselves as others see us.

SURGICAL PATHOLOGY

The second edition of Illingworth and Dick's successful work *A Text Book of Surgical Pathology*,[3] by C. F. W. ILLINGWORTH and B. M. DICK, represents an extensive revision of the original text, which has involved not only rewriting certain sections, but adding a number of new ones. The effect has been to bring the book remarkably up to date, and it is a pleasure to read chapter after chapter in which everything of importance in recent studies of each subject finds mention with unfailing regularity. The process of assimilating new observations on controversial matters into comparatively brief and necessarily dogmatic language is ably carried out. In connexion more particularly with subjects in which little progress has recently been made, there is an apparent reluctance to admit our ignorance of the true aetiology of certain diseases, which may be considered a fault; we do not really know in many cases, for instance, why patients develop urinary calculi, and the conventional recital of a list of supposed predisposing conditions implies a complacent attitude of mind in which ignorance is too likely to persist.

The arrangement and choice of subjects remains almost unaltered, and this is open to some criticism. The chapters on regional pathology, which form the bulk of the text, are preceded by discussions of a curious assortment of subjects, to which in some cases only a few pages are devoted—namely, shock, burns, tuberculosis, actinomycosis, gas gangrene, hydatid disease, tumours, and the effects of irradiation. The omission of chapters on the fundamental processes of inflammation and repair is excused on the ground that the book is written for post-graduates and senior students; but because a subject has been classed as elementary it does not follow that graduates fully understand it, or that it has achieved finality. Nor is it clear why hydatid disease and actinomycosis have been singled out for special consideration, while syphilis is not, and why gas gangrene is allotted a chapter while wound infections generally, and all the problems connected with surgical sepsis, are omitted from consideration. The book is thus far from complete, but what has been lost in these directions has permitted a gain in the fuller and more interesting discussion of the subjects chosen for treatment, together with lavish illustration.

With the exceptions mentioned, this is an excellent account of pathology as the surgeon is expected to know it. It is not only well adapted to the needs of candidates for the higher surgical degrees, but a useful work of reference for the practising surgeon.

HYGIENE OF THE HAIR

Medical men in general and dermatologists in particular are constantly bombarded by patients with questions about the care of the hair, the risks of permanent waving, the advisability of singeing, the frequency of washing, etc.—questions to which they find it extremely difficult to give satisfactory answers. If he (or she) takes the trouble to read Dr. AGNES SAVILL'S book, *The Hair and Scalp*,[4] he will be in a position to cope with this form of heckling in a most effective manner. For the first time the hygiene of the hair and scalp has been tackled in a scientific spirit. The author devotes considerable space not only to a description of the healthy hair and its microscopical structure, but also to the simple daily duties of the toilet, such as brushing and combing, washing and cleaning, etc. Her remarks are often illustrated by simple original experiments, and by photomicrographs of hairs before and after various cosmetic procedures, such as cutting, waving, and singeing. The value of this portion of the book is much increased by a chapter by Mr. W. T. Astbury on the molecular structure and elastic properties of hair. He approaches the subject from an aspect quite different from that of either the medical practitioner or the hairdresser. Mr. Astbury is a lecturer in textile physics at Leeds University, and is primarily interested in hair (by no means necessarily, or even commonly, of human origin) as the raw material from which fabrics of the most varied qualities are manufactured. He is therefore greatly concerned with the strength of the hair fibre and its behaviour when subjected to different physical processes, such as steaming,

[2] *For and Against Doctors.* An Anthology compiled by Robert Hutchison and G. M. Wauchope. London: Edward Arnold and Co. 1935. (Pp. 168. 7s. 6d. net.)

[3] *A Text Book of Surgical Pathology.* By Charles F. W. Illingworth, M.D., F.R.C.S.Ed., and Bruce M. Dick, M.B., F.R.C.S.Ed. Second edition. London: J. and A. Churchill Ltd. 1935. (Pp. 719; 301 figures. 36s.)

[4] *The Hair and Scalp. A Clinical Study* (*With a Chapter on Hirsuties*). By Agnes Savill, M.A., M.D., M.R.C.P.I. London: Edward Arnold and Co. (Pp. 288; 53 figures. 12s. 6d. net.)

wetting, and stretching. He has applied the methods of textile research to the study of the processes employed by the hairdresser in waving and curling the human hair. This chapter is well worth studying, and we may mention that he conclusively proves that "permanent waving" is inseparable from damage to the hair, although he admits that in careful hands this is very slight, and is to be regarded as trifling when weighed against the improved appearance of the hair. There are, however, without doubt, women whose hair is too fine or tender to allow permanent waving even at the most skilful hands. Recently a new physical property in hair has been discovered. It has, of course, long been known that hair can be stretched, but lately it has been found that it can be made to contract to much shorter than its normal unstretched length. The easiest way to demonstrate this is to expose the hair to *x* rays for some hours, and then to steam it. It loses at least one-third of its original length.

Although Dr. Savill has devoted an unusual amount of space (but not more than it deserves) to the cosmetic side of the subject, she has by no means neglected the various pathological conditions of the hair and scalp, which must, of course, be dealt with by a medical writer. For practical reasons she has adopted a symptomatic classification of her material. The chief symptom complained of by the patient is investigated, and is followed by a list of its possible causes. This undoubtedly facilitates reference by the busy practitioner. This portion of the book is full and sound. The author evidently is in sympathy with Sabouraud on most subjects. She is more optimistic than many dermatologists in the treatment of the common form of baldness which attacks so many males from adolescence onwards. In a treatise on the hair and scalp the illustrations are not so important as in most dermatological works, but there are plenty of them and they are well chosen. Many are interesting photomicrographs. We have nothing but praise for this book, which, if a very hackneyed expression may be pardoned, supplies a long-felt want, and will, we are sure, meet with a warm welcome from practitioners, specialists, and hairdressers.

MENTAL DISEASE AND THE LAW

Every attempt that is made to reconcile the heart-breaking differences between the medical and the legal mind deserves praise. It is particularly difficult for lawyers and doctors to understand one another when discussing mental disorder, particularly in the criminal court, where the plea of insanity is so often abused. Dr. O. C. M. DAVIS and Mr. A. WILSHIRE have collaborated in a small book[5] which should go far to clear up the ideas of both sides, and particularly those of the general practitioner and the mental specialist who are not acquainted with legal thought and procedure. Both these authors are experienced lawyers, and they have set out with economy of language and precision of method a short classification of mental disease, a study of the doctrine of criminal responsibility, and a survey of the cases in which that doctrine has been applied to the defence of insanity. Naturally the M'Naghten ruling forms an important part of their field. Some authorities, particularly medical ones, declare bitterly that this ruling has crystallized the whole attitude of the courts towards insanity on an obsolete basis by its restriction of the insanity defence to cases in which the prisoner either did not know what he was doing or did not know that what he was doing was wrong. These authors make out a strong case for the retention of the M'Naghten rule, pointing out that it is probably always a question of fact for the jury whether or not any symptom of insanity brings a defendant within the M'Naghten rule. On the question of irresistible impulse they take the orthodox view, so forcefully expressed by Lord Hewart in the case of R. *v.* Kopsch (1925), that this defence would be merely subversive and ought to play no part in criminal jurisprudence. They also include some useful matter about drunkenness, and a section giving extracts from relevant statutes such as the Inebriates Act, the Mental Deficiency Act, and the Criminal Lunatics Act. This is a very useful little book.

[5] *Mentality and the Criminal Law.* By O. C. M. Davis, M.D., D.Sc., and F. A. Wilshire. Bristol: J. Wright and Sons Ltd.; London: Simpkin Marshall Ltd. 1935. (Pp. 168. 5s. net.)

PRACTICAL TALKS ON HEART DISEASE

To simplify and yet to preserve adherence to facts is an achievement uncommon in medical literature. Simplification attains its highest merit when a mass of assorted facts becomes thereby welded into well-defined principles, but succinct abbreviation with emphasis upon salient features is far from easy. Dr. GEORGE CARLISLE, in his *Practical Talks on Heart Disease*,[6] has successfully brought the essentials of cardiological diagnosis and treatment into a small compass, and, moreover, in a form that should appeal to those whose interest is in general medicine or general practice. The importance of examination other than that of the heart itself, the relative uselessness of cardiac percussion, the true perspective of systolic murmurs, and the disposal of many common but erroneous impressions are welcome features of the book. At times a lightly ironical vein is displayed, as in the section on murmurs, where the author describes five so-called valve areas, the second being the "conventional aortic area" at the second right interspace (as distinct from the actual or anatomical aortic area in the third left space), and the fifth, the tricuspid area—"Murmurs heard best here are supposed to be produced at the tricuspid valve." In the chapter on angina, Cabot is quoted as saying, "Any pain within two feet of the heart which is brought on by exertion and relieved by rest is angina pectoris." This statement is true enough to be valuable, and laconic enough to be amusing when the precise facts are known, but it is doubtful whether those to whom the book is addressed will appreciate it.

Dr. Carlisle's strong suit is common sense, and he plays the cards appropriately and forcibly. The application of this priceless quality to the treatment of high blood pressure and cardiac neurosis is particularly noteworthy, and he castigates alike those who starve and otherwise burden the hypertensive, and those who are afraid to say confidently that no heart disease exists in the neurotic. "Doubtful opinions about the heart start fear; fear grows as it turns over in the victim's mind, and fear is always the basis of a neurosis." There is no doubt that in many cases the fear is worse for the patient than the actuality.

[6] *Practical Talks on Heart Disease.* By George L. Carlisle, M.D. London: Baillière, Tindall and Cox. 1935. (Pp. 153. 9s.)

Notes on Books

In his work on Castration in Man[7] Professor EUGÈNE PITTARD, the well-known anthropologist of Geneva, has made an elaborate study, which represents the first monograph on the subject, of the morphological changes produced by castration in the members of the Skoptzy sect whom he examined in Rumania. His principal conclusions are as follows. Castration in young subjects before the age of puberty causes a considerable increase in size of the body. The average stature of the eunuch greatly exceeds that of individuals belonging to the same ethnic group, the elongation being due to a remarkable increase

[7] *La Castration chez l'Homme et les Modifications Morphologiques qu'elle Entraine.* By Eugène Pittard. Paris: Masson et Cie. 1935. (Pp. 329. 60 fr.)

in length of the legs, in which the epiphyses unite with the diaphyses later than in normal individuals, and so allow further development of the skeleton beyond the usual period. The upper limbs also undergo an abnormally greater development. On the other hand castration causes an arrest of the skull in its three principal dimensions (antero-posterior, transverse, and auriculo-bregmatic diameters). Minor changes consist in reduction and size of the nose, ears, and mouth, retention of the voice of childhood, softness of the skin, premature wrinkles, total absence of hair of beard, of moustache, of axilla and pubis, early adiposity, exaggerated development of frontal sinuses and sella turcica, etc. On the other hand, where castration has not been performed until after puberty, the stature is little, if at all, affected, and the principal change is an exaggerated development of the breasts and buttocks. Premature old age is also the rule, as in the case of children who have been castrated before puberty. The text is illustrated by numerous photographs of the Skoptzys.

Professor ETIENNE CHABROL, in his book *La Thérapeutique Cholagogue* (Paris, J. B. Baillière, 6 fr.), discusses the possible value of these medicaments. He points out in his introduction that there is no subject in therapeutics in which the opinions expressed are more contradictory. He distinguishes between "cholagogues" which cause emptying of the gall-bladder and "cholérétiques" which cause an increased rate of secretion of bile. The cholagogue action of a number of substances such as concentrated salt solutions, oils, etc., is firmly established, but the evidence regarding "cholérétique" action is less definite. The author has himself done experimental work on this subject and has shown that, in addition to atophan and bile salts, a variety of aromatic compounds such as sodium naphtholate and certain phenol derivatives obtained from vegetables cause a well-marked increase in biliary secretion. The book gives a short review of a difficult subject, and the clinical value of cholagogues is also discussed.

Another addition to the growing library of books on the subject of child development is *Growth*, by Dr. MYRTLE B. MCGRAW (D. Appleton-Century Co. 15s.). The subtitle, "A Study of Johnny and Jimmy," indicates that this is one of the group of monographs which deals in great detail with a small number of children rather than the other main type which collects and analyses data from a large group of individuals. The two who form the object of all the observations in this book were twins—the sixth and seventh offspring of American-born, Irish-English parents. At first thought to be identical twins, there arose doubts about them during the period of investigation, and unfortunately this very vital point has to be left unsettled. For those who can read and master day-to-day details about every little movement this monograph will prove attractive. The ordinary reader may well ask whether it is a real contribution to human knowledge to know how Johnny behaved on a slope of 32 degrees inclination as compared with what he did when it was placed at 38 degrees.

The *Year Book of the American Pharmaceutical Association*[8] is a useful volume which contains, besides official information regarding the association, about 300 pages of abstracts of scientific papers. These abstracts cover a wide range of subjects—namely, pharmacy, materia medica, and inorganic, organic, and analytical chemistry. The chemical sections comprise about half the total, and include a large amount of information on recent advances in pharmacology.

Incompatibilités Pharmaceutiques, by Professor A. GORIS and M. A. LIOT (Paris, E. le François), is a volume of 140 pages which provides the French pharmacist with information similar to that given by various works in English and German. The authors provide a list of all the recognized incompatibilities.

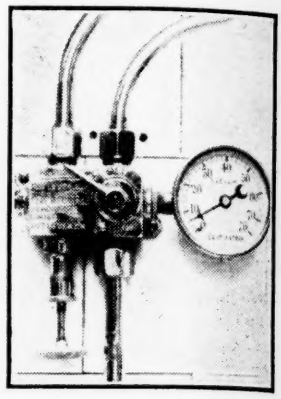
[8] *Year Book of the American Pharmaceutical Association, 1935.* Vol. xxii. Washington: American Pharmaceutical Association. 1935. (Pp. 454.)

Preparations and Appliances

A SUCKER REGULATING VALVE

Mr. HARVEY JACKSON, F.R.C.S., assistant surgeon to the National Hospital, Queen Square, London, writes:

The application of the sucker in surgery has claimed a wide field, but the types of instrument in use are such that failure in working is apt to occur at critical moments. In consequence of difficulties the adaptation of steam pressure to the induction of vacuum has given more reliable apparatus. The field in which this form of instrument has proved its value to the utmost is that of neurological surgery, where suctions of varying strengths are important in dealing with the clearing of blood from the operative exposure, the removal of debris, and removal of tumour tissue by aspiration. In order to attain the various optimum degrees of vacuum essential to each of these processes it is material that an efficient valve be introduced for the control.

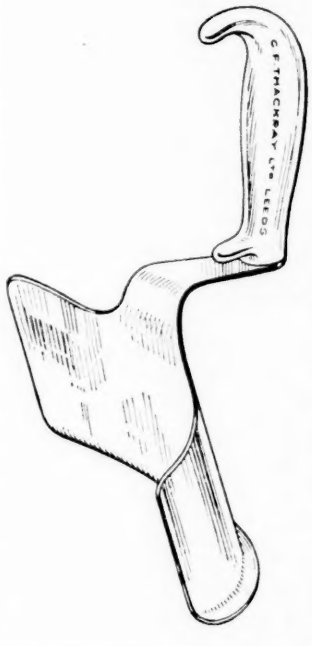


Mr. Heyes, engineer to the hospital, has constructed such a valve, and as a result the surgeons now have a dependable sucker with qualities inaccessible in water and electrical instruments previously installed. I commend the attention of surgeons to the "Heyes" valve.

AN ABDOMINAL RETRACTOR FOR OPERATIONS ON THE BILIARY TRACT

Mr. JAMES H. SAINT, F.R.C.S. (Newcastle-on-Tyne), writes:

In operations on the biliary tract the efficient exposure of the cystic and common ducts is, on occasion, not only difficult to achieve but even more difficult to maintain. The diagram shows a retractor designed with certain features to overcome these difficulties, and I have found it very useful in practice. The vertical position of the handle reduces considerably the exertion and fatigue of the assistant, so often noticeable when his hand and wrist are forced to assume an unnatural position by a horizontally attached handle. The blade is tilted backwards at an angle of 10 degrees from the vertical in order to compensate for the forward "fatigue tilt," which often results in loss of exposure at a crucial moment. Its depth is increased another inch by the ascending portion of the shank, and is capable of dealing with subjects of generous obesity. The lower end of the blade curves forward fairly sharply, and forms an efficient barrier against the peregrinations of the colon and omentum. The concavity formed by this curve adds considerably to the ease of exposure of the common duct, and provides extra space in which to work. The retractor should be placed so that the upper end of the blade is in contact with the under surface of the liver, and the direction of retraction should be in the transverse plane. This instrument was made for me by Messrs. C. F. Thackray of Leeds.



British Medical Journal

SATURDAY, DECEMBER 7th, 1935

MEDICAL SCIENCE: THE WHOLE AND THE PARTS

The new Regius Professor of Physic at Cambridge, on taking up the duties of that high office, chose an appropriate subject for his inaugural lecture, and we are glad that it will now reach a wider audience in pamphlet form.[1] "The Aims and Methods of Medical Science" might be thought perhaps to err on the side of comprehensiveness as the title for a lecture of not more than 8,000 words; but Professor Ryle's clear and brief statement of the first part of his theme left him elbow-room for a reasoned indictment of "excessive, premature, and misdirected specialism" as a harmful influence upon medical thought and action and education, and for an eloquent plea that the study of "wholes" and the study of "parts" must proceed in close conjunction. The aims of medical science as broadly defined by him are "to increase and perfect our knowledge (with a view to its control) of disease in man, and equally our knowledge of man in disease, by every legitimate means of science and art at our disposal. In furtherance of this aim the study of healthy structure and function plays a leading part. Close clinical observation and accurate recording of the living phenomena of disease; the evaluation of environmental and hereditary factors; morbid anatomy and histology; the study of the chemical and bacterial agents of disease and of immunity; psychology; biochemistry; radiology; pharmacology; dietetics; and the experimental production of disease in animals, provide the principal methods whereby the solution of our problems is sought." Few, we imagine, would quarrel with this definition of aim and method.

Some forty or fifty years ago Sir John Russell Reynolds, President of the Royal College of Physicians of London, warned the medical world against the evils of the partition of medicine and surgery into many subdivisions, which he condemned as an abuse of the division of labour. Professor Ryle, more philosophical and more realistic in his approach, makes it plain that he does not condemn specialism as such, knowing well that good specialism is essential to all scientific progress, whether in the field of practice or in that of laboratory research. He, like Hughlings Jackson before him, pleads for better integration as a counterpoise to growing specialism. The central point of his argument is that the physician, in whose work the science and art of medicine are ever complementary, is ideally one who has learned to see the problems and to see them whole. The unfolding of this theme may recall to the minds of some readers a passage in the greatest work of a physician-poet—Robert Bridges:

> Reality appeareth in forms to man's thought
> as several links interdependent of a chain
> that circling returneth upon itself, as doth
> the coil'd snake that in art figureth eternity.

As becomes a successor to Clifford Allbutt in the Regius Chair at Cambridge, Professor Ryle feels keenly the harm done to medicine and to the individual patient by abandoning what Bacon called "universality" or *philosophia prima*, and insists on the need for reintegration—a viewing of the patient as a "whole" man or woman and a studying of the disease as a "whole" disease. "Healthy and well-directed and correlated specialism is and will remain the life-breath of science, but the waste of time and moneys in the world through the drive towards isolated, pigeonholed research on the part of young men whose education has lacked breadth from the beginning and the very nature of whose appointments and whose tasks deprives them of the stimulus they most need, is to me a sad thought." He believes that the divorce of ward from laboratory is still in large part to blame for this. While the general physician is not always the man to separate and solve clinical problems in their details, "in a given case or in a given disease, he alone is, by his training, in a position to assess the contribution of the various factors at work and to indicate whether specialist help is likely to prove of value." In such a man we look for the weighing, balancing, judicial view, quick to note reciprocal actions, as of mind on body and body on mind; he cannot afford not to be a student of the whole. Professor Ryle's main argument, in short, is that segregation and specialization in medicine and the medical sciences have gone ahead too quickly; that in gaining many things some important things have been lost; that practical medicine needs to-day a revival of interest in what Sir William Gull (one of his wisest predecessors in the Guy's school) called "the general view," and avoidance of "too narrow a pathology." How, he asks in conclusion, are synthesis and integration to be achieved, so that the ward, with its associate out-patient clinic and laboratories, may once again become both the starting-point and the rallying-point of many researches? His answer to the question is twofold. First, we must train a sufficiency of students and teachers in the parent subjects, of workers in the general fields of physiology, pathology, and medicine; secondly, we must improve the liaison between the ancillary and the parent sciences, perhaps by an interchange of workers between the clinical and the scientific services. The clinician, in Dr. Robert Hutchison's phrase, is "the field naturalist of medicine"; and any system of medical education which treats him as a secondary figure stands self-condemned. Professor Ryle, whose earlier lecture at Cambridge on "The Physician as Naturalist" is not forgotten, wishes to see in our universities a better provision for the training of scientific physicians as well as medical scientists.

[1] *The Aims and Methods of Medical Science.* By John A. Ryle, M.A., M.D., F.R.C.P. Cambridge University Press. (2s.)

RHEUMATISM AND THE HEALTH RESORT

To what extent is the prevention and treatment of chronic rheumatism likely in coming years to be included in the domain of physical medicine? The question may claim attention on several grounds. The growing importance and wide applications of this branch of medicine are being recognized. The name itself has been given to a group within the structure of the British Medical Association and to a Section of the Royal Society of Medicine. The next International Congress of Physical Medicine, the *physiothérapie* of Latin countries, is about to be held in London. And, again, the more recent books on chronic rheumatic disease which have been reviewed in our columns have all acknowledged, in greater or less degree, the essential part that external applications and movement must play at one stage or another in the programme of treatment. In the opinion of Fox and van Breemen they even occupy the premier place. Physical treatment claims to bring the body into contact with the energies of Nature—sometimes with a single form of energy like ultra-violet light, sometimes with a combination of energies, as in climate. This form of treatment, therefore, may be said to rely wholly or mainly on natural energies or upon energies that have been artificially produced. The contact with Nature may be sought either at the spa or health resort—in waters, baths, climate, surroundings (the therapeutics of place)—or at the clinic or hospital, where different forms of the same energy—radiation, movement, electrical currents and resistance—can be applied. In practice, however, the natural and the artificial cannot be separated, and must indeed be often combined, at all events in temperate countries, and where provision must be made for crowded populations that cannot go far from home. But since the health resorts have led the way in the treatment of rheumatism, and are the chief places for the amelioration of the various forms of rheumatic disease in all countries, it is obvious that they should have an important place in the scheme of modern physical medicine.

An added force is given to these considerations by the report[1] presented to the fourth International Congress on Rheumatism, held in Moscow last year. This report describes a new therapeutic movement in the Soviet Republics and a new development in public health. The author, Professor Danichevsky, is the secretary of the Russian Committee on Rheumatism, and holds a chair of hydrology and climatology in that country. The conditions are obviously very different in Russia from those which obtain elsewhere. But the problem of rheumatism is so far-reaching that it is impossible not to follow with sympathy the early stages of the effort, which are described in Professor Danichevsky's report. It is indeed of more than national importance. Like the reports of the British Ministry of Health dealing with the same subjects a few years ago, it cannot fail to interest those who are responsible for public health in other countries, and the much larger number of medical men who are personally engaged in efforts to combat rheumatic disease. Since 1913, the author says, seventy-eight new spas have been opened in Russia, besides climatic stations. The health resorts have been made a branch of the public health service. They are organized primarily as places for the convalescence of the workers and the restoration of working capacity. While these changes may simplify the medical problem they greatly extend its scope.

This development of physical medicine in Russia is part of a considered plan of social and industrial betterment. In addition to the spas, *maisons de repos*, and other health resorts for summer visitors, treatment centres or clinics have been set up in the towns, particularly for the use of imported muds in the winter season. As in other European countries, semi-solid media of heat and moisture, muds or "peloids" of one kind or another, such as those derived from the *limans* on the Black Sea, from inland salt or fresh lakes, from thermal springs or from the moors (peats), are regarded as among the most effectual applications for the pain, stiffness, and swelling of chronic rheumatism. It appears that in Russia the use of such applications has gone beyond the spas and special institutes and clinics, and is beginning to form a part of the hospital system. Other new facilities for their use are the sanitary posts and dispensaries on the railway systems, especially for the early and preventive treatment of rheumatic cases. This comprehensive organization includes special provision, by boards of experts, to overcome the difficulties inherent in diagnosis and in therapeutic indications. These are the two rocks upon which many good intentions and plans have hitherto been wrecked, and not in Russia only. The widespread disappointment in the treatment of rheumatism can indeed be largely attributed to insufficient study (1) of the various forms and phases of the disease, and (2) of the actions of, and reactions produced by, the methods of physical treatment which can be applied. As regards the indications for the spas, efforts are being made in more than one country to clarify and abbreviate them. In Russia official lists are drawn up under the Commissariat of Public Health. It will be generally agreed that a clear differentiation of the spas on medical grounds should do something to promote scientific investigation in the different localities and in the accuracy and efficacy of treatment.

[1] *La Balneothérapie des Maladies Rhumatismales et ses Indications.* By Professor G. Danichevsky. Moscow, 1934. Edition du Comité contre le Rhumatisme dans l'U.S.S.R. (Pp. 175.)

TREATMENT OF VULVO-VAGINITIS IN GIRLS

The routine treatment of gonococcal vulvo-vaginitis in little girls by ordinary antiseptics and vaccines is so unsatisfactory that any new method which holds out hope of success in a comparatively short time is to be welcomed. Two articles—one by J. J. Witherspoon[1] and another by R. W. TeLinde and J. N. Brawner,

[1] *Amer. Journ. Dis. Child.*, October, 1935, p. 913.

jun.[2]—describe the use of ovarian follicular hormone and its results. This form of treatment is based on the conversion of the immature vaginal mucosa into the mature thickened stratified epithelium of the adult—which is well known to be resistant to the action of the gonococcus. Lewis[3] and Brown[4] independently reported extremely good results following the use of theelin. Witherspoon, however, found that hypodermic injections of amniotin were unsuccessful, and points out a number of objections to its use: (1) that it cannot be expected to influence a cervicitis which often complicates a vaginitis; (2) the possible harmful effect on the immature ovary; (3) the secondary changes, such as enlargement of the breasts; and (4) the high cost of treatment. On the other hand, TeLinde and Brawner, whilst admitting that amniotin administered orally or hypodermically in ethylene glycol solution is of no value (they were unable to demonstrate any effect on the vaginal mucosa), found that amniotin in oil was effective in 72 per cent. of their cases, whilst given in suppository form it not only caused the desired change in the vaginal epithelium but cured the vaginitis in every case. In their successful series of twelve cases the average number of days of treatment were 26.3; units of amniotin, 1,967; days of epithelial response, 13.1; and days for a negative smear, 17.8. The longest period of observation was five months, the shortest one month, and the average three and a half months. Moreover, their experience was that the effect on the vaginal epithelium was only transitory and they noted no harmful effects. This article contains a number of tables setting out clearly and concisely the different methods of treatment and their results, and also some figures showing the changes in the vaginal epithelium which followed the administration of amniotin. In the successful cases the lining of immature squamous epithelial cells, six to fourteen layers deep and characteristic of the child's vagina, was converted into stratified squamous epithelium twenty-five to forty layers deep. At the general meeting of the Medical Society for the Study of Venereal Diseases at Waddon in the summer of this year[5] Nabarro was inclined to favour the use of oestrogenic extract, but Kathleen Brown and Anwyl-Davies reported no good effects. These British authorities, however, appear to have used only the oral and hypodermic routes. It would seem, therefore, that the secret of success lies in giving the substance in vaginal gelatin suppositories; whether this will succeed when there is an accompanying cervicitis, and whether any late harmful effects in the internal genital organs will occur, remain to be seen. The method certainly seems worth following up, but a large number of cases will have to be treated over a considerable period before it can be recommended for routine use in replacement of an intelligent use of mercurochrome and Harrison's vaginoscope. No mention is made of infection of the rectum, which is frequently involved; Ruys[6] goes so far as to state that it is always infected. Ovarian follicular hormone can hardly be expected to influence this.

[2] *Amer. Journ. Obstet. and Gynecol.*, October, 1935, p. 512.
[3] Ibid., 1933, xxvi, 592.
[4] *Journ. Amer. Med. Assoc.*, 1934, cii, 1293.
[5] *Brit. Journ. Ven. Dis.*, July, 1935.
[6] *Journ. Amer. Med. Assoc.*, 1935, cv, 862.

DEATH RATES AND ENVIRONMENT

The New Statesman and Nation has discovered that age is a factor of mortality. It pointed out on November 23rd that, when allowance is made for differences in age and sex constitution, the death rate in the depressed areas—namely, South Wales, Northumberland, Durham, Lancashire, and Cheshire—was in 1934 higher than in the rest of England and Wales. What has apparently escaped our contemporary's eye is the fact that this statistical truth was revealed to the officials of Somerset House more than a generation ago, and that they have regularly supplied for all the larger areas of the country either age and sex standardized rates of mortality or correction factors by means of which such rates may rapidly be calculated. If our contemporary pursues its researches by actually reading the reports of the Registrar-General, it will discover that before the days of unemployment on a large scale the contrast between standardized rates of mortality in the industrial North and North-west and those of England and Wales was very much greater than in 1934. In 1913, for instance, the last complete pre-war year, the standardized death rate of England and Wales was 13.3, and of the North of England 15.7. If one takes seven northern industrial towns now suffering from great depression—Gateshead, Middlesbrough, Newcastle-upon-Tyne, South Shields, Sunderland, Tynemouth, and West Hartlepool—it will be found that their standardized death rates in 1913 were 15.9, 19.4, 16.0, 18.5, 17.9, 16.1, 17.0. The lowest of these rates is more than 19 per cent. in excess of the contemporary rate for England and Wales. The reports of the Registrar-General are obtainable from the Stationery Office. Our contemporary would find it a useful arithmetical exercise to compare over the last twenty years relative changes in the mortality rates of industrial and non-industrial areas of the country, making allowance for geographical differences. We should be surprised if this research did not show that, taking them as a whole, the worst places have improved most.

CROSS-INFECTIONS IN CHILDREN'S WARDS

Cross-infections in the wards of a children's hospital are becoming increasingly recognized as representing a promising field for preventive measures. The International Association for Preventive Paediatrics at its fourth annual meeting held recently at Basle devoted a session to this subject and reached certain important conclusions. It is stated at the outset that there is proof that these infections, responsible for an unduly high death rate, can be effectively prevented by a strict isolation of each child in a "box," and while it is realized that such a system of small private rooms is impossible for every institution, there should be general agreement that no more large wards will be built. It is especially for young infants that the danger of infection exists, and, for these, small rooms containing not more than three cots are recommended. Older children can be passed through a small room, staying there for a limited period, on their way to a larger ward. To prevent the risk of spread of infection within the building it is recommended that every child be furnished with a complete set of articles necessary for

care and treatment. Such mechanical measures alone will not, of course, solve the problem. The staff must be thoroughly educated as to the dangers and the means of dealing with them. In the first place, the nursing staff must be adequate in numbers. A good point is made when it is stated in the report of the conference that the night staff is only too often responsible for spread of infection. Here the question of numbers becomes of great importance. Most resident officers of children's hospitals will be familiar with the practice whereby a probationer nurse goes around from ward to ward during the night giving a helping hand to overworked seniors. It is also important in relation to the staff that too frequent changes are not made, and that as many as possible shall participate in the daily visit of the physician in charge. The general health of the staff, nursing and medical, is of great importance. The type of infection being discussed here is not so much the transference of gross disorders of the infectious fever type, but rather the spread of the so-called minor infections of the upper respiratory tract which may prove far more than minor disorders for the young infant. It is suggested that the use of masks for those whose work lies especially among the babies will cut down the risks of such infections. On the subject of infections brought in from outside the report speaks of the importance of home visits being made for all children admitted, so as to determine as soon as possible whether any special precautions need be taken or specific fevers be anticipated. Visiting of parents should be cut down to the lowest possible level, and that of young relatives of the patients prohibited. It is also suggested that out-patient clinics should be arranged as far as possible to prevent the accumulation of large numbers of children waiting together. The whole problem is necessarily complex, but it is a serious and urgent one. The conference closed this session with a hope that all public authorities contemplating the building of institutions for babies would submit their plans to a committee of paediatricians. It is not, however, altogether certain that this would solve the problem, for if children's physicians are in a position to prevent cross-infections how is it that the danger still exists for most if not all of the children's hospitals in this country?

TOXIC EFFECTS OF BENZENE AND BENZENE DERIVATIVES

In a recent article Drs. Danielopolu, Marcou, and Gingold[1] point out that benzene and benzene derivatives commonly produce toxic effects on the central nervous system and on the blood-forming organs. Benech in 1878 showed that convulsions and fall of temperature were associated with benzol poisoning, and this type of acute intoxication of the central nervous system has been long recognized as a form of industrial poisoning among workers exposed to benzene fumes. A wide variety of aromatic derivatives can also lead to a chronic intoxication which chiefly affects the blood-forming organs. The aplastic anaemia produced by benzene is well known, but in recent years it has been discovered that agranulocytic anaemia may follow the therapeutic use of a variety of aromatic compounds such as amidopyrine, dinitrophenol, arsenobenzenes, etc. The authors have studied the acute intoxication of dogs by amidopyrine and by benzene, and have shown that the effects are similar and are antagonized in both cases by phenobarbitone (luminal). Clinical experience has shown, however, that agranulocytosis can be caused by combinations of amidopyrine with barbiturates, a form of conjoint therapy particularly popular at present. Barbiturates therefore inhibit the acute toxic actions of amidopyrine, but not the chronic toxic effects. The combination of amidopyrine with barbiturates appears thus to possess certain peculiar dangers, because the latter are likely to mask any immediate effects of overdosage with amidopyrine. The authors stress the danger to the public of the sale of proprietary preparations containing amidopyrine, and recommend that the content of this drug should be stated clearly on the label of all such preparations. They also point out that the statement of the chemical formula alone is valueless as a protection, because few doctors and scarcely any of the general public can interpret it. This last point is of much practical importance. Amidopyrine ($C_{13}H_{17}ON_3$) is usually described as dimethylaminophenyldimethylisopyrazolone, but it also can be described as dimethylaminophenazone, dimethylaminoantipyrine, or phenyldimethyldimethylaminopyrazolon. Moreover, an ingenious organic chemist could probably coin half a dozen other descriptions which would be technically correct but almost unrecognizable.

[1] *Bull. de l'Acad. de Méd.*, Paris, 1935, cxiv, No. 34, p. 342.

HOW SURGICAL MAGGOTS ACT

Baer's observation some years ago that the implantation of blow-fly larvae in osteomyelitis wounds encourages healing has led to their extended use, at least in the United States. It has been supposed hitherto that their principal action consists in removing necrotic tissue, and known that their presence reduces the bacterial population, but attempts have lately been made to inquire further into the nature of the effects they produce, if only for the reason that an extract of maggots, if equally serviceable, would be aesthetically more acceptable. Several explanations, not mutually exclusive but scarcely likely to be all equally true or important, are advanced in recent papers. Messer and McLennan[1] have determined the *p*H of exudates in wounds treated with maggots, and observed usually an alkaline reaction attributable to the formation of ammonia by the maggots; this they credit with discouraging bacterial growth, but since the maximum degree of alkalinity observed was only *p*H 7.86, a fairly comfortable environment for most bacteria, the suggestion is not wholly convincing. They have also shown experimentally that the maggots excrete a proteolytic enzyme; the assimilation of products liberated by its action which would otherwise have to be absorbed is doubtless a favourable factor. Robinson[2] states that the excreta of maggots contain allantoin, a substance which stimulates cell proliferation. Evidently maggot excrement, strange as this may seem, plays an important part in the beneficial work, since S. W. Simmons[3] claims to have shown

[1] *Journ. Lab. and Clin. Med.*, 1935, xx, 1219.
[2] *Journ. Bone and Joint Surg.*, 1935, xvii, 267.
[3] *Journ. of Bact.*, 1935, xxx, 253.

that this material is strongly bactericidal. It has previously been observed that the lower gut of maggots and of certain insects, unlike that of higher animals, is sterile. Simmons devised a method of collecting a suspension of maggot excrement in sufficient bulk for experimental purposes, and found it to be capable of destroying staphylococci, streptococci, and several other types of bacteria in short periods of time and in what in terms of solid excrement appears to represent considerable dilution. This bactericidal activity was unimpaired by autoclaving and can consequently have nothing to do with the presence of bacteriophage. It is peculiarly unfortunate that no observations are recorded of the reaction of this material, since it is consequently impossible to compare these findings with the hypothesis of Messer and McLennan. That ammonia is the active principle seems unlikely in view of the fact that filtration apparently destroys bactericidal activity, which is thus bound up in some way with the solid particles in the material. Simmons's anticipation that here is a fertile field for harvesting new disinfectants possibly superior to those of non-living origin is perhaps unduly sanguine ; one would like to know a little more about the physical and chemical properties of this one before assuming that there may be others, or that they possess virtues hitherto unavailable. Nevertheless, the idea of using excrement as an antiseptic is so novel, not to say fantastic, that it must command interest and good wishes to anyone who out of the strangest and most repulsive therapeutic innovation of recent times has been able to extract an idea which is stranger still.

MOUNT VERNON CANCER HOSPITAL

The report of the Mount Vernon Hospital for 1934[1] opens with a remarkably interesting article by Mr. Stanford Cade on bone sarcomata. Before entering upon a discussion of the results obtained at Mount Vernon, Mr. Cade gives a concise and excellently clear summary of the site, age incidence, pathology, diagnosis, and symptoms of these growths. The osteogenic sarcoma accounts for more than 50 per cent. of all bone tumours, and is most prevalent in the age period 10 to 20 years. Attention is drawn to the fact that the earliest symptom is pain, which, however, is very soon followed by local swelling. Since the neighbourhood of the knee-joint is the commonest site for osteogenic sarcoma, and this condition gives rise to early and extensive metastases, the necessity for early diagnosis is obvious. Fortunately, the *x*-ray diagnosis is generally perfectly simple ; the danger lies in the fact that such lesions may be mistaken for "rheumatism" or some kindred affection, and treatment delayed until the patient is past all hope of assistance. Biopsy in suspected cases is absolutely contraindicated, as is also any form of treatment by the insertion of radium needles. Attention is drawn to the necessity for highly skilled radiation therapy, since the growth may be stimulated instead of inhibited by unskilful treatment. It must be remembered that radiation treatment of bone tumour is still in its experimental stage, so that each case must be considered on its own merits ; it seems, however, that a combination of radium and *x*-radiation is superior to either separately. The remaining subjects dealt with in the report must, owing to the exigencies of space, receive much briefer consideration. They include an account of the development from 200 to 900 kV roentgen therapy, by Mr. L. H. Gray, wherein he reports upon American high-voltage installations. Dr. Mottram contributes a section dealing with the work done in the department of experimental pathology ; and Dr. Fairchild—the William Morris Fellow—gives an account of the work carried out in the department of high-voltage therapy during 1934. A tabulated list of all cases treated in the hospital during the year forms a fitting conclusion to a very interesting report.

[1] The Mount Vernon Hospital for the Treatment of Cancer, Northwood, Middlesex. Statistical Report for 1934.

SKIN AFFECTIONS IN VITAMIN DEFICIENCY

In the *Annales de Dermatologie et de Syphiligraphie* for October there is an interesting article by Mouriquand and Gaté on the cutaneous repercussions of vitamin deficiency. In several cases lack of vitamins has been shown to cause cutaneous lesions ; for example, lack of vitamin A (which is typically associated with xerophthalmia), when produced experimentally in animals, is associated with degenerative changes in the skin and the mucous membranes, and with diminution in the activity of the sebaceous glands. Arguing from these premises Knypers regards infantile eczema as a result of vitamin A deficiency. Deficiency in vitamin B, which has now been shown to be a complex mixture of several more specific vitamins, is especially connected with beri-beri and pellagra. The dry form of beri-beri is often accompanied by a scaly skin very liable to infection and by sensations of burning in the soles of the feet. Some of the leading symptoms of scurvy are also connected with the skin. In mild cases it merely takes on an appearance of goose-flesh, which is due to the formation of a diminutive cone at the openings of the hair follicles. In more severe cases typical haemorrhagic petechiae appear, and as the capillary walls are more and more affected by the disease ecchymoses and swellings caused by subcutaneous and intramuscular haemorrhages occur. Perhaps the most interesting problem in the relations between vitamin deficiency and the skin is presented by pellagra. Its aetiology is still not absolutely settled, but there is no doubt that it is very largely a disease of the ill nourished and is especially typical of those regions where the sole, or at any rate chief, article of diet is maize. It has been thought that the disease was caused by the absence of a special vitamin contained in the husk of the grain, which is discarded in threshing, but this theory is now regarded as inadequate. It appears that the complex vitamin B is composed of at least two different groups—B_1, which is anti-neuritic, and B_2, which quite recently has been shown to be itself a mixture of several constituent elements, one of which, B_6, is the "true" anti-pellagrous vitamin. It is not possible to detail all the work which has been done on this subject, but it now appears to be decided that for the production of pellagra at least two factors are necessary: first, there must be a deficiency of vitamin B_2 and B_6, and, secondly, the diet must be ill balanced in other ways. Apparently the simple absence of the anti-pellagrous vitamin is

insufficient in itself to cause the disease ; some other factor is essential. This may be either the addition to diet of a toxic substance, most often alcohol, or infection, or exposure to strong sunlight, for it is well known that pellagra always begins during the summer and that its symptoms lessen during the autumn and winter. In this there is an interesting contrast between pellagra and rickets. There are also sporadic cases of pellagra that seem to arise without any defect of alimentation. This perhaps may be explained by some digestive anomaly which prevents the utilization of the vitamins that are essential for cutaneous nutrition.

MOTHERHOOD IN POOR AREAS

At the suggestion of the organization known as "The Council of Action" an inquiry has been carried out by Dr. Margaret Balfour and Dr. Joan Drury into the "effect which unemployment conditions have on mothers," and the results of their inquiry are set forth in a pamphlet entitled "Motherhood in the Special Areas."[1] The investigators were given a period of about ten weeks in which to draw up their report, and they rightly decided that anything like a general survey would be impossible. They accordingly chose the area comprised in Durham County and the Tyneside. The inquiry was necessarily conducted upon sociological rather than medical lines. The facts which are presented are for the most part familiar to all who are interested in the health services of the country, but it is very difficult to bring them to the notice of the great general public, who pay for these services but know little or nothing of the way they work. If the Council of Action can get this pamphlet read in the ordinary English home it will have accomplished an educational work of some value. To the medical reader some of the "facts which emerged" are trite—for example, that "the mother is the centre of the household," that the teeth of the people were extremely bad, that the house rents were extremely high in comparison with income, and that some of the housing conditions were unspeakably bad ; some examples given would certainly shock the uninformed if they could only be brought to their notice. Considerable space is given to the subject of the diet of the expectant mother ; Professor E. Mellanby's table is quoted with approval, in which are regarded as essentials: two pints of milk, two small cabbages, one or two eggs, and one apple or an orange daily. We are not told how the expectant mother is to be persuaded to consume these essentials, even if she were willing to draw upon her scanty cash resources to buy them for her own consumption. If the Council of Action undertook a campaign to instruct the average English mother in food values and in the elements of culinary science it would be doing work of national importance. The pamphlet *Family Meals and Catering*, drawn up by the Nutrition Committee of the British Medical Association, of which 63,000 copies have already been sold, should help a great deal in this task of educating the housewife.

[1] Motherhood in the Special Areas of Durham and Tyneside. By Margaret I. Balfour, C.B.E., M.B., F.C.O.G., and Joan C. Drury, B.Chir., L.R.C.P. The Council of Action, 216, Abbey House, Victoria Street, S.W.1.

FRACTURES AND INCAPACITY

As already briefly reported in our Parliamentary Notes (November 2nd, p. 881) the Government (on the day before Parliament was dissolved) announced its intention to appoint an interdepartmental committee of the Ministry of Health and the Home Office "to inquire into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents, and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto, regard being had to the recommendations made in the report issued by the British Medical Association in February, 1935, on "Fractures." This is a highly satisfactory outcome not only of representations to the Government that the whole question of rehabilitation of the disabled called for the closest investigation, but also of the publication of the report of the British Medical Association's Committee on Fractures. It is obvious from the terms of reference that the committee's report has succeeded in focusing attention on the necessity for a higher standard of fracture treatment in any scheme directed towards reducing accident incapacity. The B.M.A. committee found that while in many fracture cases incapacity was due to failure to apply the main principles of treatment after union had been secured, by far the largest causative factor was the almost complete absence throughout the country of organized fracture treatment. It held that the practice in hospitals to-day (with one or two exceptions) of admitting fracture cases to general wards, and, on discharge from the wards, of referring them to massage departments under the charge of persons who have had nothing to do with the earlier treatment, was largely responsible for the prolonged—sometimes permanent—disability which too often followed. In broad outline the recommendations of the committee were: (1) that fracture treatment should be provided at special units established in connexion with a voluntary or municipal hospital (the decision as to which of these should undertake the organization of the unit in a given area being determined by local circumstances) ; (2) that all fracture cases within the area should automatically be sent to this unit, which could be either a department within the hospital or a separate institution ; (3) that the staff of the unit should be responsible for treatment, from primary reduction, through all phases of remedial exercise, to complete restoration of function ; and (4) that each unit should be under the supervision of a surgeon interested and expert in traumatic surgery. In the opinion of the committee there will be no diminution in the number of cases of disability following fractures until treatment is organized on these lines. Moreover, there are no insuperable obstacles to the early establishment of such fracture units in all large areas of population. The committee's report sets out in considerable detail a model scheme for a fracture unit at a large general hospital, and makes suggestions for the establishment of rehabilitation centres providing graduated work. While, then, the general task of the Government's inquiry committee is by no means easy, it should have no difficulty, with the B.M.A. report before it, in making recommendations on that part of its problem which is concerned with incapacity caused by fractures.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the nervous system met with in general practice.

TREATMENT OF SYPHILIS OF THE NERVOUS SYSTEM

BY

GORDON HOLMES, C.M.G., M.D., F.R.S., F.R.C.P.

Before undertaking the treatment of a patient who is presumably suffering with syphilis of the nervous system it is essential to be certain not merely of the diagnosis but also of the nature of the lesion. This requires a full and careful clinical examination as well as laboratory tests of the blood and cerebro-spinal fluid.

In the first place it is obvious that the presence of a positive Wassermann reaction does not alone, or even in conjunction with changes in the cerebro-spinal fluid, necessarily indicate that the lesions responsible for the patient's symptoms are of syphilitic origin, for unfortunately even syphilis does not safeguard us from other troubles. As an instance I may refer to two patients, recently at the same time and in the same ward under my care with signs of increased intracranial pressure and positive Wassermann reactions, in whom on operation simple gliomatous tumours were found. On the other hand, symptoms of disease which is beyond doubt of luetic origin may occur in the absence of the so-called "positive serological signs," and these symptoms may be active and even progressive. In this category may be included certain forms of paraplegia of spinal origin developing in patients who have had syphilis, or in whom after death pathological examination reveals lesions of a syphilitic nature. In tabes dorsalis this is occasionally so too; for example, a patient with this disease whom I have had under observation for years has, despite negative Wassermann reactions in both the blood and the cerebro-spinal fluid and no pathological changes in the latter, grown more ataxic, suffered in succeeding years as intensely, or perhaps more severely, with lancinating pains, and has developed arthropathies and gastric crises. Such cases are not rare, and they emphasize the importance of studying carefully the clinical features of each patient, of refusing to lose sight of the patient behind the test tube, of "*Menschenbehandlung nicht Syphilisbehandlung*" (the treatment of the patient, not of the syphilis) as Nonne, whose experience in the treatment of neurosyphilis is probably unrivalled, has insisted—in fact, the importance of dealing with a case of nervous syphilis as we do with disease of other organs of the body.

Uses and Limitations of Laboratory Findings

Insistence on the necessity of directing and controlling treatment by clinical observation and of a recognition of the exact nature of the lesions in the nervous system does not mean, of course, neglect of laboratory methods, which can frequently supply us with valuable information on the activity and the course of the disease. Examination of the cerebro-spinal fluid is always essential before treatment is instituted, provided that time is not lost in dealing with acute lesions, and it should be repeated during the course of treatment. The findings in the fluid are particularly useful in the exudative types of meningeal syphilis, as they are an indication of the state and the degree of the involvement of the membranes: a diminution in the number of cells and a return of the protein to approximately normal proportions point to success and also, often, to the advisability of a change or modification of treatment. The Wassermann reaction in the cerebro-spinal fluid is also a useful guide in these cases, as with successful treatment it gradually weakens or disappears, often while it is still positive in the blood. The Lange gold reaction is less important, as a positive response frequently persists in spite of treatment and after all signs of active disease have disappeared; it seems to be of little significance in prognosis.

In my experience the state of the cerebro-spinal fluid is of less importance in the treatment of vascular and parenchymatous nervous syphilis, and particularly in tabes dorsalis and general paralysis, though it is valuable as an accessory means of diagnosis. A positive Wassermann reaction may persist in these diseases despite the most vigorous treatment and though all signs of activity or of advance of the pathological processes have been absent for years. I could cite many cases of tabes in which the Wassermann reaction is still positive though the patients suffer only with the effects of the structural lesions acquired in the earlier stages of the disease, and in some of the cases I have seen of general paralysis which have been most successfully treated by malarial infection the reaction in the fluid is still positive. There can be no doubt that in such instances prolonged and indiscriminate treatment is not only unnecessary, but may be even harmful.

Types of Disease

It is well known that the nervous system may be involved in any stage of syphilis, but the earlier affections, as the acute meningeal reactions which occur during the secondary stage, do not come within the scope of this article. Here we have to deal with patients with established lesions. These, which may take various forms, can be, to simplify the principles of their treatment, divided into

1. *The meningeal type,* in which the predominant lesion is acute or chronic infiltration by gummatous cells of the membranes of the brain or spinal cord. As, however, the underlying nervous tissue is almost always involved too, these conditions would be more accurately described as meningo-encephalitis or meningo-myelitis.

2. *The vascular type,* in which endarteritis may reduce the blood flow to, or occlusion produce softening of, the nervous tissue within the distribution of the vessel. A periarteritis, either accompanying the intimal lesion or associated with meningeal infiltration, also may damage the nervous tissues around the arteries.

3. *Systemic or parenchymatous syphilis,* characterized by the predominant affection of neural tissues.

Treatment by Drugs

Each of these groups requires special consideration before treatment is instituted, but it is necessary to deal first with the therapeutic agents at our disposal and what can be expected from their use. These are mainly the heavy metals—arsenic, mercury, and bismuth—but the iodides should be included here too. Mercury and iodide, which were the chief standbys of thirty years ago, have been to some extent superseded by arsenic in the form of salvarsan or allied substances, and by the salts of bismuth which have been more recently introduced.

Arsenical Preparations.—The most valuable of these is undoubtedly arsenic, though there are certain risks and disadvantages associated with its use. The preparations most commonly used are salvarsan (606), neosalvarsan or novarsenobillon (914), and silver salvarsan, but drugs containing arsenic in a pentavalent form are also favoured in the treatment of special conditions, as tryparsamide, particularly in America, and stovarsol or its sodium salt, in France. The first course of neosalvarsan or of novarsenobillon may be given at five- to seven-day intervals, as follows:

1st dose	... 0.3 gram	4th dose	... 0.6 gram
2nd ,,	... 0.45 ,,	5th ,,	... 0.6 ,,
3rd ,,	... 0.45 ,,	6th ,,	... 0.9 ,,

In second and subsequent courses the initial dose may be 0.6 gram, provided no complications occurred during the first. The risks in the employment of these arsenical compounds are undoubtedly less than in the use of those originally introduced, but any of them may, particularly in the early stages of the treatment, excite local reactions around syphilitic lesions and thus aggravate the symptoms or produce new ones; in early or acute cases it is therefore advisable to start treatment with mercury or bismuth. Tryparsamide and stovarsol, on the other hand, may affect the optic nerves and lead to rapidly progressive loss of sight. During their use a careful watch is necessary on the state of vision. Further, patients occasionally show an idiosyncrasy to arsenic, and the necessity of long-continued intravenous injections is a handicap—in private practice at least.

Bismuth.—The toxicity of bismuth salts is much less, but I have seen a few cases of polyneuritis result from their indiscriminate use, and they are not so apt to produce such focal reactions in the central system as is arsenic. The administration of bismuth by intramuscular injections is also easier, and though probably not so immediately effective as arsenic its action persists longer. It is therefore both useful and convenient in the treatment of latent and chronic affections. Any preparation of bismuth hydroxide (3 grains in each injection) may be used, or the more soluble salts—for example, the salicylate or the iodobismuthate of quinine. Doses should be calculated according to their content of the bismuth metal, of which 2 to 3 grains should be given in each injection.

Mercury.—Though mercury has been to some extent eclipsed in favour of newer remedies it still remains one of the most valuable agents we have in the treatment of syphilis of the nervous system, and if properly employed I do not believe the results are surpassed by those of either arsenic or bismuth, except perhaps in the treatment of acute attacks in the earlier stages of infection. The most effective and the most easily controlled method of administration is by inunction, which is preferable to and safer than intramuscular injections of the metal or of any of its salts. Oral dosage can be recommended only in chronic cases between more intensive periods of treatment. But to obtain full benefit from mercury it is essential that it is administered in adequate amounts. Gowers's method, which has been generally followed in the National Hospital, is the thorough rubbing in of a drachm of blue ointment or other suitable preparation twice a day until the patient slightly salivates or experiences a metallic taste; the inunctions are then stopped and the patient is given, after a few days, large doses of iodide for ten days to a fortnight; the inunctions are then recommended. Three, four, or more courses of inunctions are given, as may be necessary, at appropriate intervals. During treatment the teeth and mouth should be carefully looked after; though salivation and swelling of the gums may be for a few days inconvenient to the patient who is fully under the influence of the drug, these discomforts soon subside. For injection, mercury can be administered in the form of calomel (3/4 to 1 grain) or of salicylate of mercury (1½ to 2 grains), in a suitable base.

Iodides.—The fact that even large and prolonged doses of iodide have no influence on the Wassermann reaction has allowed it to wane from favour in the treatment of syphilis, though the older clinicians proved its value in gummata and other superficial lesions. It has certainly a similar action on the infiltrative lesions of the nervous system, but the heavy metals are preferable, owing to their more rapid and effective action. Its chief use in neurology is in the prolonged treatment of vascular disease and of chronic lesions which have passed their acute stages. In such conditions doses as large as the patient will tolerate should be given, starting with half a drachm and increasing to one drachm a day.

Attempts to produce active immunization to syphilis by injection of non-pathogenic spirochaetes have been frequently made, especially on the Continent. Benedek has recently employed the method introduced by Hilgermann in the treatment of nervous syphilis with promising results, but it is still in the experimental stage.

Necessity for Prolonged Treatment

It is, however, in the combination of these various drugs that the most effective treatment of syphilis of the nervous system, as of general infection by the spirochaete, is to be found; though arsenic, bismuth, mercury, and the iodides are all of particular value in the treatment of certain forms of neurosyphilis, there are few cases in which we can rely on one only to the exclusion of the others. Some authorities, for instance, advise where active and rapid treatment is necessary, as in early infection by syphilis, the simultaneous administration of arsenic and bismuth, or of arsenic and mercury; others prefer to alternate these drugs. The essential point is prolonged treatment while the disease is active, or when any risk of a recurrence of active lesions exists. The diagnosis of neurosyphilis makes it imperative to insist to the patient on the necessity of continuous or intermittent treatment for months, perhaps for years.

Acute Meningeal Syphilis

Either the membranes of the vertex or the base of the brain may be predominantly affected, the former producing palsies, local or general convulsions, or mental changes: the latter, paralyses of the cranial nerves, often associated with other signs of a basal meningitis. Or the membranes of the spinal cord may be chiefly or exclusively involved, usually with the symptoms of a myelitis. It is, however, the acuteness of the process rather than its distribution that should determine the mode of treatment. An attack of acute syphilitic cerebral meningitis, or of spinal meningitis accompanied by a transverse or diffuse myelitis, demands early and energetic treatment, as every day it lasts increases the risk of permanent damage of the nervous tissues. Fortunately prodromal symptoms often occur which, when recognized, indicate immediate action.

Though there is a slight risk of exciting reactionary changes, the so-called "neuro-recidives," by the use of arsenical preparations, the danger of permanent damage resulting from the primary lesion is so much greater that this risk must be taken and an intravenous injection of neosalvarsan (0.6 gram) or of novarsenobillon (0.6 gram) be given at the earliest possible moment. It should be repeated on the fourth or fifth day unless any contra-indication appears. Intramuscular injections of a suitable preparation of bismuth may be given at the same time, preferably in soluble form, as it is more rapidly absorbed,

or a vigorous course of mercurial inunctions may be started.

The full course of injections of the arsenical drug should be administered, usually six to eight doses, five to seven days elapsing between each injection. When these are completed the patient should have a series of intramuscular injections of bismuth or of mercurial inunctions, and then another course of arsenic: in fact, courses of arsenical and bismuth injections should alternate until all signs of active disease have passed and examination of the cerebro-spinal fluid reveals a fall in the number of cells and of protein to the normal, or approximately thereto. The Wassermann reaction in the blood is a more reliable guide to the necessity of prolonged treatment than that in the cerebro-spinal fluid. In the treatment of acute meningeal lesions arsenic and bismuth surpass mercury, as they act more quickly and more effectively; but in certain cases, after the acute stage is over, efficient inunction of mercury till salivation or other signs of saturation appear gives excellent results.

Chronic Syphilitic Meningitis

Chronic syphilitic meningitis, either cerebral or spinal, demands treatment on the same lines, but as the lesions vary in nature as well as in their distribution and severity more discrimination is necessary in deciding on the methods to be adopted, the duration of the cure, and especially in giving a prognosis.

There is usually a diffuse chronic infiltration of the membranes by cells and considerable thickening of the meninges by increase of connective tissue within them, which, as in the case of the so-called hypertrophic meningitis most commonly met with in the cervical region of the spinal cord, may reach massive proportions. In other cases the roots of the spinal and cranial nerves are chiefly involved, producing pain or palsies in their peripheral distributions. The underlying nervous tissue is always affected in some degree by the extension into it of infiltrating cells (first along the sheaths of the vessels), and by compression or interference with its blood supply. The symptoms which the patient presents are, of course, due to these disturbances in the nervous tissue, and on the intensity and nature of them the prognosis depends. As the necessity of treatment is not so urgent as in acute cases, and as there is a risk of exciting reactionary changes by the injections of arsenical preparations, it is advisable to begin with intramuscular injections of bismuth or inunctions of mercury. Later, energetic courses of neosalvarsan should be instituted and alternated with further administration of bismuth or mercury. Treatment should be kept up for several months at least, and the cerebro-spinal fluid should be repeatedly examined as its state is a helpful guide in prognosis as well as in therapy. In these cases iodide in large doses is particularly useful, as it undoubtedly favours the resolution of the gummatous infiltration and has probably some influence on the secondary fibrosis in the meninges and blood vessels.

The treatment of *gummata*, which can be regarded as local accentuations of the meningeal process, should be essentially the same as that of other chronic meningeal lesions. Potassium iodide in large doses is particularly useful when the infiltrative changes have been checked by more vigorous measures. The limitations of medical remedies must, however, be recognized; they cannot lead to complete absorption of the necrotic material and of the fibrous tissue which form a large part of each gumma, and no matter how successful drugs may be a scar is eventually left behind. When this produces symptoms of compression, and especially of irritation, as it may when situated in the cortex of the brain, it may be necessary to deal with it as with any other tumour or irritative lesion by surgical measures.

Syphilitic Lesions of Vascular Origin

Lesions of this nature are among the most serious complications and are certainly the least amenable to treatment, as when the patient comes under observation there is usually occlusion of one or more arteries and consequently complete or partial necrosis of the tissue supplied by the vessel. The most common form is hemiplegia resulting from thrombosis of an artery in which there is advanced endarteritis. It is rarely possible to hope for restoration of the circulation, and the most at which one can aim is to prevent a spread of the thrombosis. The immediate injection of neosalvarsan or other arsenical preparation is rarely advisable. The administration of iodide in large doses and the intramuscular injections of a soluble salt of bismuth are safer and probably equally effective measures. Mercurial inunctions can be started too. After ten to fourteen days arsenic may be safely given intravenously, and may be supplemented by injections of bismuth. Iodides should be continued for several weeks at least. The intravenous administration of a 2 per cent. solution of sodium iodide has been recommended, but it is doubtful if it is more effective than potassium iodide by the mouth.

Tabes Dorsalis

It is now universally recognized that tabes is always secondary to infection by syphilis, but this does not mean that it can be treated on the same lines as other syphilitic affections, or that corresponding benefit can be expected. Many of the older authorities in fact doubted the efficacy of anti-syphilitic treatment, but most neurologists are now agreed that it may at least influence favourably the course of the disease. The essential lesion is a degeneration of certain afferent fibres of the peripheral nervous system, particularly of the posterior roots, which according to some authors results from inflammatory processes in the roots or of the meninges through which they pass. Such inflammatory changes may be present though they are not constant, nor can they explain the selective nature of the degeneration. It is more probable that the essential factor is the action of a toxin, probably of syphilitic origin, on the nerve fibres. The nature and pathogenesis of the disease therefore impose serious limits on the benefit that can be expected from anti-syphilitic measures. In tabetic optic atrophy there are inflammatory as well as degenerative changes in the optic nerve, but this condition is notoriously resistant to treatment.

The difficulty in estimating the value of anti-syphilitic therapy is due to the fact that tabes is usually not a gradually progressive disease; in a considerable proportion of the cases, as Gowers taught, the symptoms remain stationary for long periods and may never advance; or if it is progressive it may be by temporary exacerbations, after each of which some improvement may occur independently of the treatment. There can be no doubt, however, that anti-syphilitic therapy when judiciously employed benefits many patients suffering with tabes, and considerable improvement may be effected in acute cases or during acute exacerbations. The lancinating pains are often relieved to some extent by intravenous injections of arsenic, but it occasionally happens that for a time at least they are more frequent or severe after treatment. The intramuscular administration of bismuth is in my experience the most useful anti-syphilitic remedy in chronic cases of the disease. Two or four courses of twelve injections may be given each year, or they may be alternated with inunctions of mercury, or mercury and iodide may be taken by the mouth between each course of bismuth. Although neosalvarsan cannot produce the striking benefits which it may in acute syphilitic lesions of the nervous system, some patients experience

from it subjective improvement at least, and its rational use tends to prevent the development of other lesions to which, however, the tabetic seems to be less prone than other syphilitics. Excessive or too prolonged dosage is inadvisable, as it occasionally has an unfavourable influence on the patient or on his disease. Course after course of treatment merely to abolish a positive Wassermann reaction, which has little relation to the severity or progress of the disease, is to be deprecated.

General Paralysis

Before malarial treatment was introduced it was the almost universal experience that no anti-syphilitic remedies had any curative influence in general paralysis, and in most cases did not influence the course of the disease. More recently arsenic in pentavalent form has been employed with some success. Tryparsamide by intravenous or intramuscular injections has been used extensively in America and sodium stovarsol subcutaneously on the Continent. Unfortunately both are apt to produce optic atrophy, and their administration therefore must be immediately stopped if there is any complaint of impairment of vision. The first dose of tryparsamide should not exceed 1 gram, but if the drug is well tolerated it can be increased to 3 grams. Ten to fifteen injections may be given at weekly intervals. As stovarsol may excite neuro-recidival reactions an injection of bismuth should be given before or at the same time.

The introduction of malarial therapy has, however, revolutionized the treatment of general paralysis ; no form of anti-syphilitic treatment can give at all comparable results. But as malarial infection should be undertaken only by those experienced in it, and in suitable conditions, it will not be described in this article. Energetic anti-syphilitic treatment, preferably by one of the arsenical preparations, is essential when the patient has completed his series of rigors, and should be repeated at intervals during the subsequent two years at least.

THE RELATIONSHIP OF THE RECENTLY DISCOVERED ERGOT ALKALOIDS

During the past year considerable interest has been roused by announcements in British, American, and Continental scientific journals concerning new active alkaloids isolated from ergot, which have as one of their characteristic features the ability to produce remarkably quick and vigorous uterine action when given by the mouth to a woman in the post-partum period. Although four such alkaloids have now been described and diversely named, no satisfactory evidence is as yet forthcoming to show that they are not one and the same substance. Before discussing the relationship of these alkaloids—ergometrine,[1] ergotocin,[2] ergostetrine,[3] and ergobasine[4]—it may be well to review the present position of the new substance (or substances) in therapeutics.

Clinical Properties of the New Alkaloid(s)

Two papers have appeared lately dealing with the clinical use of ergometrine and ergotocin respectively. Moir[5] in this country discusses the relationship of ergometrine to the previously known ergot alkaloids, and concludes that the new principle combines the obstetrically useful characteristics of the previously known alkaloids with other valuable properties which the latter substances lack—namely, rapid action when given by the mouth or injection ; complete freedom from immediate toxic effects (headache, depression, and nausea) ; and complete, or almost complete, absence of gangrene-producing properties. He stresses the usefulness of ergometrine in post-partum haemorrhage associated with uterine atony, and advocates its administration by intravenous injection when a maximum effect is desired in a minimum time ; by this means a powerful uterine spasm is produced within one minute. In comparison with pituitary extract the uterine action is more constant, and for patients presenting signs of shock and loss of blood ergometrine is stated to be a safer drug—pituitary extract in similar circumstances carrying with it the risk of reduction of cardiac output, because of constriction of the coronary arteries, and hence an aggravation of the symptoms of shock. Moir points out that the clinical action of ergot, reported by obstetricians more than a century ago, has its exact counterpart in the action now known to be characteristic of ergometrine. The spasm-producing properties of this drug make it dangerous to use during parturition (as distinct from the puerperium), for it is this very spasm which caused the *pulvis ad partum* of the earlier writers to be cynically renamed the *pulvis ad mortem* by later disappointed users. Adair, Davis, Kharasch, and Legault of Chicago[6] discuss the clinical action of ergotocin. Their conclusions are in many respects similar to those just quoted with regard to ergometrine. The value of intravenous injection of ergotocin in cases of post-partum haemorrhage is also stressed, and special reference is made to its use in Caesarean section as a preliminary to incision of the uterus. In such circumstances the administration of ergotocin is quickly followed by a blanching of the uterine musculature and a wrinkling of its surface. Separation of the placenta is greatly accelerated. Ergotocin is also recommended for use in incomplete abortion. The writers emphasize the safety of the new substance, and show that undesirable side effects—such as the temporary suppression of urinary secretion seen after injection of pituitary extract—are absent in the case of ergotocin. The new drug is recommended wherever oxytocic therapy is indicated.

Clinical reports on ergostetrine and ergobasine are not yet available, but there is no reason to doubt that their clinical action will be found to be identical with that of ergometrine and ergotocin.

The Relationship of the New Alkaloids

There is no doubt that these new alkaloids are already an important addition to therapeutics, and their use is likely to increase greatly as their properties become more widely known. It is therefore highly desirable that the identity, or non-identity, of the various new substances should be finally decided with as little delay as possible. Meanwhile, it can be said that their chemical and pharmacological properties, as recently reported,[3 7 8 9 10 11] present such remarkable similarity that little doubt is left that the four alkaloids are in fact identical substances. Assuming that this is so, the question of nomenclature becomes important, and it is earnestly hoped that the already complicated relationships of the ergot alkaloids will not be confused by alternative names for the same substance. There are many unhappy examples of such confusion in medical literature.

The question of identity of the ergot alkaloids has already been the subject of discussion in the *Lancet* and in the American journal *Science*. In the latter journal a judicial summing up of the situation has been made by Sir H. H. Dale,[12] who, basing his views on the available evidence and assuming that the four alkaloids are identical, makes out a very strong case for the adoption

of the name "ergometrine" as the standard and international name for the new substance. Those interested in this matter are referred to the journals mentioned; only a brief review of the various claims can be made here.

Ergometrine

In consequence of clinical experiments carried out in this country by Chassar Moir (1932),[13] the conclusion was reached that ergot contained an active principle still unidentified which acted with great rapidity when given by the mouth, and to which the useful clinical action of ergot was due. Hitherto it had been supposed that the alkaloids ergotoxine and ergotamine* were essential for the usefulness of an ergot extract. The new experiments showed that this was not so; moreover, these alkaloids had a clinical action of a type different from that under discussion. Later discovery of two further alkaloids, sensibamine† and ergoclavine, did not alter the situation, for they were found to have an action indistinguishable from that of ergotoxine and ergotamine.

A search for this new principle was at once started by the late H. W. Dudley with Chassar Moir, the latter worker checking the activity of various new chemical fractions by clinical experiment. When the new principle was finally identified it was found to be yet another alkaloid, but of a constitution much simpler than that of the alkaloids previously known to occur in ergot. To this substance the name ergometrine was given, and a description of its method of isolation, its chemical properties, and its pharmacological and clinical action was published in March, 1935,[1] and shortly afterwards amplified.[14 15 5 7 8] Its formula has been established as $C_{19}H_{23}O_2N_3$ (Dudley[7]).

Meantime, in 1932, following a personal description and demonstration by Moir of the methods by which his basic clinical experiments had been made in this country, a repetition of the earlier work was carried out by clinical workers in Chicago and Baltimore. In each instance a co-operation with chemical research workers was effected, and an independent search begun for the elusive ergot factor. This had the result, in many ways satisfactory, of an almost simultaneous and double confirmation of the findings of the British workers. The substances thus isolated were called ergotocin and ergostetrine respectively.

Ergotocin

In February, 1935, a paper was published by Davis, Adair, Rogers, Kharasch, and Legault[16] of Chicago entitled "A New Active Principle in Ergot." It dealt not with an isolated chemical substance, but with an impure preparation of high clinical activity, which was stated to be non-alkaloidal; and it was further stated that a manufacturing firm had "given it the trade name 'ergotocin.'" The method of production was not revealed, nor was satisfactory information given concerning the chemical or pharmacological properties. It was suggested that when its molecular structure was determined it would perhaps "be found to resemble closely pituitrin." In a footnote, however, it was stated that later work had resulted in the isolation of a crystalline substance, but no further chemical data were given.

A month after the preliminary account of the chemical properties of ergometrine by Dudley and Moir, Kharasch and Legault, in *Science*, announced the discovery of a new ergot alkaloid, and to this they transferred the earlier registered name "ergotocin." Kharasch claimed (*Lancet*, May 25th, 1935) that this ergotocin, because of a slightly higher melting-point, was a substance distinct from ergometrine, but this differentiation was later shown to be unjustified. In subsequent publications[10 6] the Chicago workers have given a more adequate account of the chemistry, pharmacology, and clinical properties of ergotocin, although they have not yet published its method of isolation. Meanwhile, notwithstanding the fact that they attribute to it the formula $C_{21}H_{27}O_3N_3$, satisfactory evidence is still lacking that ergotocin is other than ergometrine.

Ergostetrine

Ergostetrine is the name given by Marvin R. Thompson of Baltimore[3 17] to an ergot alkaloid for which recognition is claimed on the grounds of prior discovery. The question is very involved, and in part concerns a name "legally assigned" to a substance which was not till a later date described in recognizable terms. It thus appears that for this alkaloid no satisfactory publicity was given and no adequate description made prior to the discovery and published description of ergometrine, nor is evidence available to show what properties were attributed to ergostetrine at the time that this name was coined and protected for trade purposes. Thompson, however, makes no suggestion of any difference between ergostetrine, as now described, and ergometrine. With him the difference is merely one of name.

Ergobasine

In May, 1935, Stoll and Burckhardt,[4] working in the Sandoz Laboratories in Switzerland, described a new alkaloid, ergobasine, for which the suggestion was made that it differed from ergometrine partly on account of the nature of the optical activity of its solutions. It appears, however, that the optical activity determined for ergobasine referred to a solution in water, whereas the original description of the optical activity of ergometrine referred to a solution in chloroform. Now it is known that optical activity may change according to the solvent used—Stoll himself having shown this to be true for ergotamine—and it is not surprising, therefore, to find that subsequent and more comparable observations have shown that ergobasine and ergometrine have optical properties in common. The formulae assigned to the two alkaloids are also identical.

It is satisfactory to record that at the recent "Medizinische Woche" at Montreux Sir Henry Dale was able publicly to mention that an amicable agreement had been reached whereby samples of ergometrine and ergobasine would be exchanged and examined by the two sets of workers in order to establish once and for all the identity or non-identity of the substances, and that a joint communication would be issued on their combined findings. It is to be hoped that a similar friendly arrangement may also be possible with the two groups of American workers. By such co-operation much unnecessary discussion might be avoided.

Ergometrinine

Finally, yet another, and certainly a distinct, ergot alkaloid has recently been isolated by Smith and Timmis[18] of the Wellcome Research Laboratories. This is an isomer of ergometrine, and shares with it the formula $C_{19}H_{23}O_2N_3$; it has consequently been named "ergometrinine." We are informed in a private communication that clinical experiments by Moir have shown that it is inactive when given in the dosage required for ergometrine. We understand

*Ergotamine tartrate is known clinically as "femergin" and "gynergen."

†Known clinically as "ergone."

also that laboratory tests have shown that ergometrinine has practically none of the characteristic pharmacological effects of ergometrine or of any other of the ergot alkaloids. Although ergometrinine is thus unlikely to interest clinicians it may prove to be of great importance to chemists, for a study of the molecular structure of the active and the inert isomers may possibly reveal the nature of the atomic grouping which endows an otherwise inactive molecule with oxytocic properties.

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IMPERIAL CANCER RESEARCH FUND

DR. W. E. GYE'S FIRST REPORT

Dr. William Ewart Gye joined the staff of the Imperial Cancer Research Fund in 1913 and continued there until 1919, since which time he has been working under the auspices of the Medical Research Council. On October 1st of this year he became Director of the Imperial Cancer Research Fund, in succession to Dr. J. A. Murray, who has been director of the Fund for some twenty years. Dr. Gye's report was submitted to, and adopted by, the General Committee of the Fund at its meeting on December 4th.

The new director reviews in broad outline the sweeping changes which have taken place during this century in the outlook on the causation of cancer. An extreme pessimism prevailed throughout the whole of the profession at the time when the Imperial Cancer Research Fund was established in 1902. A belief that cancer was a disease limited to man and occurring only in civilized communities, where it was increasing at a terrifying rate, amounted almost to dogma. Investigation along orthodox lines of animal experimentation was deemed impossible in the light of a firm belief that all animals were resistant to cancer. The experiments of Hanau, who proved that a rat tumour did exist and could be transmitted by inoculating pieces of the living tumour tissue into other rats, were ignored, and, keenly alive to the significance of his discovery and distressed at the apathy with which it was received, Hanau committed suicide. Morau's confirmation of his work was no more favourably received, perhaps because neither of them established sufficiently clearly the fundamental distinction between the transmission of cancer, which they had achieved, and the transmission of infectious diseases. Jensen's work along the same lines received more attention simply because he made the distinction clearly.

Comparative and Statistical Data

At the same time Dr. E. H. Bashford, the first director of the Cancer Research Fund, began to study old animals, realizing that most animals which come under scientific observation are killed before they reach middle or old age, and conceiving the possibility that the characteristic age incidence of cancer in man might be of general significance and applicable equally to animals. By keeping the short-lived mouse in large numbers it was possible to substantiate this concept and establish statistical data showing a cancer incidence in mice increasing with increasing age and with a frequency similar to that found in man. There followed a series of comparative investigations, and cancer was found throughout the vertebrate kingdom wherever it was looked for properly.

This investigation emphasized the essential fact that the process which takes place when a normal cell becomes malignant is the same in whatever species or whatever organ it occurs. Thus for the first time a true conception was gained of the extent and distribution of cancer. Side by side with this general and comparative study of the disease Bashford and Murray were conducting an examination of the phenomenon of transplantation. It was found, as Jensen had shown, that the tumour formed from a cancer tissue graft is derived from the living malignant cells which have been inoculated. The normal tissues, at least with carcinomata, are not "infected." They further confirmed that transplantation is successful only with the species from which the tumour is derived, hence the failure of earlier workers to transmit human cancers to the lower animals.

The Local Origin of Cancer

The most important fact that they established, however, was that the propagation of a mouse cancer in mice can be continued indefinitely. The malignant cells live and multiply in an unlimited number of generations of normal mice, passage through successive generations being unable to affect the malignant qualities of the transplanted cells. It follows that the primary cause of the disease must be sought for in the cancer cell itself, or to quote James Ewing, "The secret of malignancy seems still to remain enshrouded in the obscurities of intracellular life. . . ." The application of these observations, Dr. Gye continues, lies in the fact that almost all the "cancer cures" which are produced from time to time are based on the idea that tumours arise and grow because of some constitutional defect in the body of the patient. It has been assumed that cancers progress because some glandular structure is inadequately discharging a function of controlling "growth." Thus extracts of pituitary, suprarenals, and in some cases parathyroids, have been prepared and injected into patients in the hope of bringing about a cure. The theories upon which these practices are based are in obvious conflict with the conception of the nature of cancer indicated above. Nevertheless, all such preparations are thoroughly tested, but up to the present they have all been found valueless.

The demonstration by experiment of the local origin of tumours confirmed the conclusions reached by the morbid anatomists of the late nineteenth century, and justified those operative practices which aimed at the complete removal of the tumour as early as possible. The results of experimental cancer research consolidated what had hitherto been a tentative, unstable theory; it gave a theory of the nature of cancer which had a direct effect on surgical procedures. As Sir Henry Butlin wrote as early as 1912, "The advantages which have been gained for the cancerous person by the institution of a good working theory for a bad one are greater than the mind of man could have conceived."

The Formal Genesis of Cancer

The physiology of the malignant cell has been extensively studied by the methods introduced by Warburg, and the results obtained have had an influence on general physiology. But interest is no longer confined to the microscopical study of the cancer cell. The attack has been extended to the onset of the disease. Yamagiwa and Itchikawa in 1915 gave an impulse to research by showing that cancers could be induced *de novo* by repeated applications of tar. Their investigators opened up a fresh field of endeavour, and now Professor Kennaway and his collaborators have been able to synthesize chemically pure substances with definite carcinogenic properties. Some of these substances are related chemically to the sterols, which are normal constituents of the body.

Thanks to the discovery of substances which have the property of inducing cancer, it has become clear that two aspects of the problem of cancer causation must be sharply distinguished: first, that which deals with the conversion of a normal cell into a malignant cell; and, secondly, that which deals with the properties of the malignant cell itself. James Ewing calls the first of these processes "the causal genesis of cancer," under which term may be included the most diverse agents—tar, pure chemical compounds, parasitic worms, *x* rays, etc. The second process he terms "the formal genesis of cancer," referring notably to the power of the malignant cell to proliferate indefinitely. There exists now a well-defined group of avian tumours, of the type first described by Rous, which can be propagated by means of cell-free filtrates. The intracellular agents which are present in such filtrates and are responsible for the propagation must be assigned a specific part in the formal genesis of cancer. Moreover, the recent discovery of a filterable papilloma of the cotton-tail rabbit by Dr. R. E. Shope has broken what was previously an apparently absolute difference in respect of filterability between tumours of mammals and tumours of birds. Further, more recently still Professor McIntosh claims to have transmitted by cell-free filtrates growths which were originated in fowls by the injection of tar subcutaneously.

The systematic investigation of cancer, Dr. Gye remarks in conclusion, which began in an atmosphere of ignorance and pessimism just over thirty years ago, is now being carried on vigorously in every civilized country. The knowledge of this disease which has been gained in this relatively short time is more extensive than that of many other chronic diseases, and has profoundly influenced both diagnosis and treatment.

HEALTH RESORTS ASSOCIATION

The third annual general meeting of the British Health Resorts Association was held at 28, Portland Place, W., on November 28th, the chair being taken by Lieut.-Colonel R. H. Elliot, the founder of the association and its chairman of council. A letter was read from Lord Horder in which he declared the prestige of the association to be steadily if slowly increasing in the eyes both of the public and of the profession. "I am so sure that its work is of value that I trust the discouragements which have of necessity accompanied the economic depression of the past years will not lead any of us to relax our efforts. I am confident that the near future will see the association one of the most important factors in the national recovery."

Colonel Elliot said that the report showed that the one object of the association had been actively pursued during the year—namely, the encouragement of the use, by the medical profession and the public, of British health resorts of every kind, large and small, seaside, inland, and spa, and to stimulate the authorities responsible for these places to make them more efficient and attractive. The association had now held eleven conferences, all by invitation of the local authorities concerned, and during the past year it had met at Buxton and Margate, and had held some useful discussions. Its *Handbook*, published annually at the beginning of the year, was a very important factor in the work, containing, in addition to much general information, details of the health-giving qualities of the resorts. The other work of the association might be described as specialized publicity, answering inquiries from members of the medical profession and the public. The Medical Advisory Committee, which consisted of some twenty-five medical men, met monthly under the chairmanship of Lieut.-Colonel W. Byam. The association was grateful for the support it had received from the medical profession, and representatives of the Royal Colleges, the British Medical Association, and the Society of Medical Officers of Health were on its Medical Advisory Committee. He concluded with a warm acknowledgement of the work of Dr. Alfred Cox, the secretary, who had shown great tact and energy in getting the association established.

In the general discussion a representative from Skegness announced that his town had decided to become a subscriber to the association. A representative from Margate stated that great benefits had already followed from the conference held there in the summer, while another representative said a hundred conferences had been held at Buxton during the last six years, but none of them had proved so useful to the locality in their subsequent results as the conference last April under the auspices of the association. Buxton had just had its best season since the war. The annual report of council and the financial statement were adopted. Lord Meston (who, it was stated, could not be present because he was in India) was re-elected president, and Sir Walter Langdon-Brown, Lord Horder, Mr. Reginald C. Vaughan, and Sir Stanley Woodwark were made vice-presidents.

At a conference attended by thirty-eight representatives of local authorities and other organizations co-operating with the Department of Scientific and Industrial Research in the investigation of atmospheric pollution Dr. G. M. B. Dobson, F.R.S., chairman of the Atmospheric Pollution Research Committee, presented a report on the progress of the researches carried out under the committee. The conference noted with interest the offers received from co-operating authorities to undertake additional investigations and observations (including observations in country districts). A report was presented by Mr. J. W. Beaumont upon the analysis of atmospheric dust samples collected in Leeds, Halifax, and Huddersfield. The representatives of the London County Council brought to the attention of the conference the desirability of reviewing the measures which have been taken in this country and elsewhere to obviate the emission of soot, ash, grit, and gritty particles from chimneys such as those of electric power stations. Representatives of other local authorities emphasized the need of a wider investigation, which should include the consideration of remedial measures for combating pollution. After further discussion the conference appointed a small committee to meet the Department and thereafter to put forward concrete proposals for consideration.

A NOTE ON SURGERY IN MOSCOW

BY

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Much has been written on medical organization in the Soviet Union. The more specialized field of surgery has possibly not received the attention which it deserves. Perhaps an account of what I saw during a recent visit may prove of interest to others.

The Sklifassovski Hospital, or Institute of Emergencies has 450 beds—200 devoted to general and surgical emergencies and 250 to traumatic surgery. This institute receives emergency cases from all Moscow. Since the population of Moscow has grown to four and a half millions as compared with one and a half millions seventeen years ago, this number of beds is quite inadequate, and a further 350 are being added. Hospital extension is constantly being made all over the Soviet Union, and in this respect Moscow is no exception. Like emergency hospitals everywhere else the Sklifassovski is always full and wards are crowded. Pressure on beds is eased by the early transfer of suitable cases to convalescent homes, and by drafting minor cases to other hospitals. In this connexion the homes for incurable cases, of which I shall have more to say, are useful for taking in patients who are likely to be invalided for a long period—bad spinal injuries, fractured pelves, severe burns, and so on.

Professor Burdenko operating at the Neuro-Surgical Hospital. In the foreground is the apparatus for a constant record of the arterial pressure.

Abdominal Surgery

The institute, which is under the direction of Professor Yudin, is a hive of activity. Two operating theatres are busy night and day. Professor Yudin was on holiday, but I had the privilege of watching the work of Dr. Arapov, one of his first assistants. He told me that it was not uncommon for four or five partial gastrectomies to be performed in the course of a single night, since the practice is to treat perforated gastric and duodenal ulcers by gastrectomy within nine hours of their rupture. The mortality rate, I was told, for all cases of partial gastrectomy is 5 per cent.

Dr. Arapov uses the Billroth I method, and for anaesthesia does a regional field block, infiltrating the undersurface of the peritoneum with 1/2 per cent. novocain. Gently pulling on the greater curvature, he infiltrates the lesser omentum with about 20 to 30 c.cm., and the gastrocolic omentum in the angle between pylorus and duodenum with a similar amount of the same solution, which seemed a rapid and simple procedure. Vichnevsky, of the Institute for Blood Transfusion, has perfected a method of local anaesthesia for abdominal work which amounts to massive infiltration of the mesenteries with dilute solution, the fluid gravitating into the retroperitoneal tissues, a method of which I heard several Russian surgeons speak with enthusiasm.

Storage of Blood for Transfusion

It is at the Sklifassovski that the method of procuring blood for transfusion popularized by Professor Yudin is in use. Within six hours of death from suicide or by street accidents, or from angina, blood is drawn off, typed, subjected to the Wassermann test, collected in jars, and preserved in ice chests. Post-mortems on the cadavers exclude the presence of disease, which might render the blood unsuitable for transfusion. The special merit of this method lies in the fact that the blood cannot clot, thus obviating the use of citrate. As is well known, a few hours after death blood liquefies through fermentative processes, and provided it is kept in cold storage it will remain unclotted. Such blood is not kept for longer than six or seven days, and since one cadaver yields about three to four pints there is always a plentiful supply of typed blood available for emergency purposes. Moscow surgeons are prodigal in their use of blood transfusion, so that it is a common sight to see, in the course of an operation, a junior assistant walk in unobtrusively and "up-end" the contents of one of the jars of preserved blood through a needle into the saphenous vein of the patient. The objection to this method is that this blood has not as high a haemoglobin index as fresh blood, and in most of the other hospitals blood is obtained in the usual way from donors; but in the Sklifassovski the use of preserved blood is a routine measure.

Like all Moscow hospitals the Sklifassovski has small wards devoted to the immediate post-operative care of patients who have undergone a serious operation, after which they are sent to bigger wards. But again, like most other Moscow hospitals, these are overcrowded and the equipment is of the simplest. As a result, judged by our standards, the wards are cheerless.

I was shown the very efficient method of bringing in emergency cases. A complicated system of electrical devices regulates the dispatch of ambulances. Each ambulance takes a doctor with it, and it is a matter for some pride with the staff of the Sklifassovski that within one minute of receiving a call a complete unit is on its way. Coloured lights on the main roads near the hospital signal ambulances which may have been sent on a false alarm to return, and the central station in the hospital is in constant communication with them.

The Sklifassovski is used for post-graduate instruction only. The Botkin Hospital, a large general hospital, similarly restricts its hospital practice to post-graduates. Many of the surgeons at the Botkin are women. There I saw Dr. Thal, Professor Otchkin's first assistant, operating. She advocates partial gastrectomy as the method of choice for duodenal and gastric ulcers, and uses Finsterer's technique. For carcinoma of the rectum the combined abdomino-perineal operation is done here, and some operations for inguinal hernia were being performed by Bassini's method.

Surgery of the Central Nervous System

Professor Burdenko was kind enough to take me round with him to the Neuro-Surgical Hospital and to the First Moscow Hospital. He is the director of a surgical unit at the First Moscow, chief of the Neuro-Surgical Hospital, president of the Medical Society of the U.S.S.R., president of the All-Union Surgical Society, and heads the Prosthetic Committee of Military Surgeons. He holds

the Order of Lenin, the title of Honoured Scientist of the U.S.S.R., and is an elected member of the Central Executive Committee, a Governmental body. He is perhaps best known to us through Dr. Harvey Cushing's quotations of his work on the neurogenic theory of peptic ulceration.

Professor Burdenko teaches and practises general surgery. I saw him do several gastric and orthopaedic operations, but his specialty is the surgery of the central nervous system. He works at the Neuro-Surgical Hospital, which has 100 beds. There is a surgical staff of four assistants and four registrars, with, in addition, a group of neurologists, radiologists, and biochemists. I was shown a large number of *x*-ray films demonstrating the arteriographic method of localizing brain tumours with the use of injections of thorium salts. There were numerous ventriculograms on record in the diagnostic rooms, and the museum contained many pathological specimens.

The operating theatres are air-conditioned, a special theatre being used for septic cases. Their technique in brain operations follows closely that elaborated by Cushing, and for anaesthesia they use avertin and local. In operations on the fifth nerve they favour Dandy's occipital approach, where the second and third divisions are chiefly involved. A continuous blood pressure record is obtained throughout operations by means of an apparatus perfected at this institution. A cannula is tied into the dorsalis pedis artery, and a graphic record indicates the patient's condition at any moment during the operation. The wards have recently been renovated and the whole institution enlarged. To it come most of the complicated neurological cases in the Soviet Union, though there are neuro-surgical hospitals at Leningrad, Rostov, Gorki, and Kharkov.

The First Moscow Hospital

At the First Moscow Hospital in the Pirogovskaya (named after the famous Russian surgeon Pirogoff) there are three surgical units, of which Professor Burdenko's is one. It has 160 beds, and is in charge of ten chief assistants and twenty house-surgeons. This is an undergraduate teaching hospital, and since students come in two complete shifts, one in the morning and early afternoon and one in the late afternoon and evening, a great deal of arduous teaching work devolves on the teaching staff. The second shift is necessitated by the number of students who do other work unconnected with medicine for part of the day and wish to become doctors. After the third year this duality ceases, and medical study is regarded as whole-time work. An appreciable number of nurses become doctors in this way. These students are, of course, paid a stipend while pursuing their studies.

In the museum of the First Moscow there are a large number of specimens showing gastric erosions and small ulcers in cases where tumours of the third and fourth ventricles have been present. It is this phenomenon which first led Professor Burdenko to propound the neurogenic theory of the causation of gastric and duodenal ulcers. Dr. Smirnoff, who is chief research biochemist to Professor Burdenko, told me about her experimental work on shock. She has many records of experiments which show that the fall of blood pressure in shock is due to the inhibition of the action of adrenaline by its quinone oxidation products. She is now working on the problem of eliminating these oxidation products.

Ample provision is made for chronic and incurable cases. These homes have a staff of fully trained doctors and nurses. Patients do not pay, but the pensions which they receive for old age and ill-health are appropriated as payment while they are inmates.

In the U.S.S.R. it is usual for three or four operations to be performed simultaneously in one theatre. Since the major part of surgical work is done under local anaesthesia it is a common thing for the patient who is having an abdominal operation to find himself a few feet removed from another who might be undergoing an amputation of the thigh. This practice is not unusual elsewhere on the Continent, and when the question was raised as to whether the psychological effect on patients was harmful it was met with some surprise. Soviet surgeons maintain that a nervous patient is no more nervous in such an atmosphere than he would be in a theatre devoted exclusively to his own case. This may, however, be merely making a virtue of necessity, and more adequate facilities will in the future, I have no doubt, lead to a different outlook.

Simplicity of Technique and Equipment

Russian surgery is characterized by a simplicity in technique and a bareness of equipment which is obviously a carry-over from the lean years. We are accustomed in modern theatres to an elaboration of technique, a paraphernalia of gaily coloured sheets, many instrument trays, and much accoutrement, so much so that in some of our hospitals a surgeon going in to operate takes almost as much care in dressing for the part as a leading actor. This may be due to an overdose of seeing ourselves as others see us on screen and stage. Whether it is actually reflected in our mortality figures is something I leave others to decide. In Moscow operating theatres at the moment surgeons are limited in their choice of "gadgets," with the result that their operations have a kind of Spartan simplicity which appears almost indecent to us. Suture materials are confined to silk and catgut. Surgical gloves are incredibly bad, and fit as loosely as our post-mortem gloves. It is a tribute to the skill of their surgeons that they are able to work in loose, ill-fitting gloves.

Nurses' homes are regarded as an anachronism. It is considered wrong to coop nurses up in institutions and subject them to regulations and restrictions which are inevitable in such circumstances. Many nurses are married, and they come to their work in the Moscow hospitals in the same way as workers going to a factory or office. Sometimes blocks of apartment houses are built close to the hospitals for the convenience of the nursing staff, but their husbands and children, if any, live with them. I ought to add that since a nurse's uniform consists mainly of a white overall put on over everyday clothes, and since Moscow's everyday clothes at the moment are of very poor quality, nurses do not convey an impression of neatness and cleanness. This is sure to be improved upon as the rapidly increasing standard of living advances.

It is amazing to see the preponderance of women medical students. At the First Moscow fully 75 per cent. of the medical students are women. This is due to the fact that for the present men are more attracted to engineering and technical work.

I have mentioned the fact that some of the operating theatres are air-conditioned and that many others will follow suit. I feel that surgeons everywhere should agitate strongly for this boon in their theatres. It is almost a tradition with us that a surgeon should work in an exhausting atmosphere of heat and little ventilation. The theatres of the Post-Graduate Hospital at Hammersmith are an example in this country of work done under the best conditions.

Economic Status of Surgeons

I shall conclude with a few words on the economic position of surgeons in the Soviet Union. Salaries vary, and more responsible posts are better paid. All medical salaries have recently been increased. A surgical specialist attached to a large hospital would receive about 1,500 roubles a month. The average rate of pay for the whole population of the Soviet Union is now about 160 roubles a month, so that 1,500 represents fairly good remuneration, though variations in the price of goods make all estimates of income difficult to assess by our standards. There is, of course, no unpaid voluntary work, and in most cases wives of doctors work and earn a salary as well. Housing conditions are still so poor that a surgeon in Moscow may have to be content with a two-roomed or three-roomed apartment for himself and his family, and at the moment very few surgeons have a car at their disposal, so that they must rely on Moscow's overcrowded public transport service.

Groups of Soviet surgeons occasionally attend conferences in other countries. They themselves hold frequent congresses. It should help the advancement of surgical knowledge, both here and in the Soviet Union, if groups of British surgeons would undertake visits to the surgical clinics of the Soviet Union, and if they in turn would invite their Soviet colleagues here. Arrangements for such visits could be made through the Society for Cultural Relations with the U.S.S.R. or possibly directly through the Soviet Embassy.

MEDICAL SCIENCE SINCE HUXLEY

ABSTRACT OF PROFESSOR EDWARD MELLANBY'S LECTURE

The Huxley Biennial Lecture was delivered at Charing Cross Hospital Medical School on November 28th by Professor Edward Mellanby, who took as his subject "The Rapid Advance of Medical Science since Huxley."

Huxley died forty years ago, and it was difficult nowadays, said the lecturer, for young people to realize the influence exerted by his personality and writings at the time when he himself was an undergraduate. The first prize he ever got at Cambridge was invested in the purchase of all Huxley's works. In those days it was customary for undergraduates to discuss before various societies the topics which had interested them; on reading again some of his own undergraduate efforts he had been impressed by the extent to which he must have been influenced by Huxley. Many of Huxley's teachings had now passed into common currency; many of his views, intensely controversial at the time, were now accepted as a matter of course. His *Collected Essays* were the finest English literature ever written by a man of science. Huxley was a medical man, trained at the Charing Cross School, but he was no ordinary medical man. The treatment of disease never interested him, and he never practised. But that hospital might pride itself that, if it did not make Huxley a great doctor, it did help to provide him with the early training which made him a great scientist and philosopher.

The Conquest of Disease

It must be puzzling to those who read the *Essays* to notice how little space Huxley devoted to medical science as opposed to physical science. The explanation was that medical science had hardly begun in his day, and even biological science was largely observational. In an essay in 1866 Huxley remarked: "We have learned somewhat of Nature; we only partly obey her. Because our knowledge is imperfect and our obedience not complete typhoid is our companion and cholera our visitor." If Huxley were to enter Charing Cross Hospital now he would discover a revolution in the diagnosis and treatment of disease. He would find many diseases being treated and cured for which in his day there was no cure or control apart from *vis medicatrix naturae*. Modern advances in nutrition would have pleased him, confirming all he had written about biological activity. He would have rejoiced also to see the rise of antiseptic surgery and the general acceptance of the principles of asepsis. In some years in the 'sixties the deaths from scarlet fever numbered over 90,000. Huxley declared that the nature and cause of this scourge would one day be as well understood as were those of silkworm disease in his own time, and the long-suffered massacre of infants would come to an end. Since then the organism of scarlet fever had been isolated, its structural and chemical activities detected, and an antitoxin prepared. The killing power of the disease had decreased tremendously. In 1875 the deaths numbered 720 per million of the population; in 1934 only 20 per million. Professor Mellanby gave the results of a large-scale experiment in London. During the last two years 1,877 children received treatment by the intravenous injection of scarlet fever antitoxin, and 1,419 received the same treatment except that no serum was injected, and these therefore could be regarded as controls. The tendency was to give the worse cases the antitoxin treatment, so that really the figures were weighted against those receiving this treatment. Among the 1,877 cases so treated only two deaths occurred, and among the 1,419 cases twelve deaths, while the average stay of the former in hospital was 18 days and of the latter 33.9 days. He thought Huxley would have rejoiced at seeing this scientific advance.

Huxley and the Experimental Method

Up to this point, said the lecturer, Huxley, had he been present, would have been distressed by this paean of praise, and would probably have departed, so he proposed to say a few words in criticism of him in the hope of bringing his spirit back again. He had grave doubts whether Huxley ever appreciated the significance of the experimental method of investigation as a principle. It was surprising to him that Huxley should never have specified or used the words "experimental method"—in fact, the word "experiment" itself was seldom used by him. It might be thought, perhaps, that he took it for granted that the experimental method was synonymous with scientific research, but there was other evidence that he did not appreciate experiment—as, for example, his criticism of Francis Bacon. Huxley hated the idea of pursuing knowledge because of the practical results; it must be pursued for its own sake. No man received greater admiration from Huxley than Descartes, who accepted and preached the experimental method and extolled the work of Harvey on the circulation of the blood as pointing the royal road to discovery, yet Huxley never seems to have mentioned this aspect of Descartes' writings, except casually.

Frankly, this attitude of Huxley disturbed him. Huxley was more an exponent of science than an active investigator for many years of his life, yet here he was scorning the particular views of his brother philosophers Bacon and Descartes when, with wonderful foresight, they proclaimed the experimental method which had so greatly transformed the world. Huxley was an investigator of the observer type, and this might have hindered his appreciation. To quote Lord Moulton, "When reduced to observation, science crawls; as you can use experiment science advances rapidly." The common use of the experimental method had been the greatest factor in the advance of medical science since Huxley's day.

One of the greatest triumphs of the experimental method had been to establish on the firmest basis a view advanced by Claude Bernard in 1865, that many diseases were due to the abnormal working of processes which, when physiological, resulted in good health. Health and disease were often different aspects of the same thing. When the innumerable chemical agents were present in the right amount and working in harmony perfect health resulted; when unbalanced and inadequate the result was ill-health. The modern methods of medical science were laid down in an astonishingly specific way in Claude Bernard's *Introduction à la Médecine expérimentale*.

Laboratory Control

The lecturer went on to suggest some of the changes which would interest Huxley if he could enter a hospital now. Though the interpretation of a morbid condition still rested largely on the physician's past experience, the control of diagnosis and treatment by laboratory methods had become more and more prominent. Some regretted this, and said that the art of medicine was disappearing. This was true, but it seemed useless to regret it. The new method was only an additional weapon in the doctor's

hands. The physician must make himself the master of these ancillary laboratory procedures as he had made himself master of the stethoscope and the like.

Surely it was a good thing for the medical student entering the war for the first time not to be told to forget his physiology. The wise physician recognized that physiology was the basis of pathology and pharmacology, and pathology with pharmacology and therapeutics largely made up the science of medicine.

Another advance in the chemical control of the body—which was one of Huxley's main teachings—was to be found in the results from many quarters showing the diverse and yet associated activities of specific chemical agents in the animal body. It was now realized that such widely different substances as cholesterol, bile salts, ergosterol, the female hormone, and vitamin D were not only closely related chemically, but in some cases had a common physiological action. In this group also could be placed certain cancer-producing agents. There was an essentially unifying effect in all this new knowledge of biochemistry. Even the changes of old age might be due to imbalance of chemical agents of the body.

The Personal Factor in Research

Finally the lecturer addressed himself to one or two aspects of medical research. In his capacity as Secretary of the Medical Research Council it was his duty to assist in every way this branch of activity. Success in medical research depended almost entirely on the type of man attracted to such work. Men of this type were limited in number. They must be clever men, but in addition men of strong character, capable of hard and often disheartening work, and willing to forgo riches. But short of these rare men, something could be done by attracting able men of lesser stature. There was something unsatisfactory about the training in medical science in the universities. Huxley lived in a time when specialism in medical science was developing. Since his death specialism had become rampant. But the investigators who were needed were men of widely trained type who had sufficient knowledge of their technique to be able to use it as an instrument, so that in research they could command the right method of approach.

In recent years the Medical Research Council's policy had been to set up definite posts in clinical science. The question of obtaining suitable men was the limiting factor. This policy had his whole-hearted support, though he was sometimes rather alarmed by the advocacy of its adherents. He would be sorry if clinical science confined itself to a study of diseases in man and refused to enter the laboratory, just as he regretted the instances where laboratory workers could not or did not have access to patients. The future success of clinical science as a special subject must depend upon its ability to use and develop methods of experiment. He was an earnest advocate of combined clinical and laboratory work.

Was there any royal road likely to lead to important discovery? Some said *ad hoc* research was useless, and the only hope was to work on some academic research unrelated to practical utility. He knew no royal road to discovery. Discovery sometimes came about by pure chance, sometimes by deliberate effort in the direction aimed at. Though important discoveries were rare, and difficult to make in any case, it was no more unlikely that discoveries of first-class scientific interest would result from work directed to practical problems of disease than from work inspired by no utilitarian motive. In this instance he took an entirely opposed view to Huxley. When Huxley deprecated research for utilitarian results he could not have recognized that disease in man was often simply abnormal physiology.

THE MEDICAL CURRICULUM

SECOND REPORT BY G.M.C. COMMITTEE

The General Medical Council at its November session received a second interim report from its Curriculum Committee, of which Dr. H. L. Tidy is chairman. The full text of the first report appeared in the *Journal* of June 15th (p. 1222). That report was sent to the licensing bodies and schools, and their observations have been received. The Minister of Health has also forwarded observations, on behalf both of his Department and the Board of Education, on the provision of instruction in mental disease and defect, and the committee has had before it a short memorandum by the Medical Education Committee of the British Medical Association. This second interim report states the provisional views of the Curriculum Committee on the more important points made in these observations.

Admission to Curriculum and Student Registration

The recommendation that the medical curriculum proper should not be entered upon before the age of 18 years is generally approved by those who have submitted observations, but some have made the remark that latitude should be allowed in the application of the new age limit. The committee believes that sufficient latitude would be secured by an understanding that students might enter at the beginning of the term in which they attain the age of 18 years.

The committee's remark that "the present standard [of general education] should be raised" has given rise to misapprehension, and therefore it is proposed to be added that if one or two subjects of general education at an approved standard be taken at the pre-registration examination in addition to scientific subjects the standard of the present examination in general education which a student is required to pass before admission to the curriculum may remain unchanged.

With regard to the preliminary scientific subjects, the committee emphasizes that more advanced instruction in organic chemistry will be included in the course and examinations in physiology. The committee has been impressed by the volume and character of the criticism against its recommendations with regard to instruction in biology, and proposes to modify its previous recommendation to the extent that it may be permissible for a student to pass an examination in biology conducted or recognized by one of the licensing bodies before registration as a student or commencement of the medical curriculum proper. But it adds that at whatever stage a student passes an examination in biology, the instruction given him in anatomy and physiology should, throughout its course, be directed to securing systematic reference to the biological aspects of each of the subjects.

Medical Curriculum Proper

The recommendation of the committee that instruction in the principles of genetics should be given as part of the instruction in histology in the human anatomy and human physiology course has elicited observations which make it desirable for the committee to explain that this instruction in genetics, as also the instruction in cytology, was not intended to relate to more than the elements of these subjects. The committee also proposes to redraft, modifying slightly, its resolution under "applied anatomy and physiology," so that it would read: "Regular instruction and demonstrations in applied anatomy and physiology during the period of clinical studies, to be carried out as arranged by the teachers of anatomy and physiology and of the clinical subjects," as part of the course in medicine.

With regard to the introduction to the clinical subjects which it is recommended should take place during the period of study of the professional scientific subjects, the committee thinks it desirable to make it plain that the subjects in question—namely, the elements of the methods

of clinical examination and an introduction to general pathology and bacteriology, should be designed in principle to illustrate the subjects of anatomy, physiology, and histology, and their application to clinical medicine and surgery, but should not include the systematic study of diseases. The committee also thinks that the object in view would be achieved more successfully by associating clinical and scientific subjects over a period of a year than by a more intensive course during a few months.

The recommendation that a student should not pass to the period of clinical studies until he has satisfied the examiners in the subjects of the first two years has not met with acceptance in the observations received. The committee, on reconsideration, suggests that the introduction of the student to general pathology and bacteriology should be effected not, as originally proposed, by making provision for instruction and examinations in this as a separate subject, but by incorporating the requisite instruction in that given in physiology, to which, with anatomy, the period of study of the professional scientific subjects is primarily devoted, and in which the student will necessarily be examined at the end of this period as a condition of his entry to the period of clinical studies.

Period of Clinical Studies

The recommendation that closer contact of students with patients, and the enjoyment by students of some measure of responsibility, should be facilitated by a provision for a continuous period of residence in hospital is generally approved, subject to reservations on two points from some of the bodies: that the periods of residence need not necessarily be continuous, and that the object in view, although desirable, may not be easily attainable within any period that can be foreseen. The committee thinks, however, that discontinuous periods of residence would not effect the object in view. With regard to the second reservation it is pointed out that residence need not be on the hospital premises, but in convenient proximity.

It is proposed to append a note to the resolutions dealing with instruction in special branches of medicine and surgery that such instruction should be directed to the attainment of sufficient knowledge to ensure familiarity with common conditions, their recognition and treatment.

With regard to instruction in psychology and mental disease, the committee states that the Ministry of Health and Board of Education have suggested that mental deficiency should be included among the special subjects for which instruction is expressly provided. It agrees to amend its resolution accordingly.

To meet criticisms on the ground of ambiguity, the committee proposes to redraft the resolution which relates to courses of instruction throughout the period of clinical studies in pathology and bacteriology. It will read as follows:

> "Pathology and Bacteriology.—Courses of instruction throughout the period of clinical studies in (1) general and special pathology (functional and structural) and morbid anatomy; (2) clinical and chemical pathology; (3) general and clinical bacteriology; and (4) immunology and immunization."

The paucity of reference in the first interim report to the subject of instruction in preventive medicine has been made a ground of criticism of which the committee has taken careful note. It points out that in its preamble to the resolutions it laid it down that throughout the whole period of study the attention of the student should be directed by his teachers to the importance of the measures by which normal health may be maintained and to the principles and practice of the prevention of disease. For the purpose of directing attention more easily to this point the expressions "normal health" and "prevention of disease" are to be printed in the draft resolutions in heavy type. The phrase in the preamble is also to be amended to read: "the importance of the measures by which normal health may be *assessed and* maintained."

This second interim report is proposed to be circulated to the licensing bodies and to the deans of medical schools.

England and Wales

Royal Free Hospital: Annual Dinner

The annual dinner of the London (Royal Free Hospital) School of Medicine for Women took place at the Savoy Hotel on November 28th, under the presidency of Dr. H. Haldin-Davis. The company numbered well over three hundred. The chairman, in proposing the toast of "The School and Hospital," said that among the academic distinctions of the staff during the year was the election of Dr. Chodak Gregory to the Fellowship of the Royal College of Physicians; she was only the second woman to obtain that honour. On the occasion of the previous annual dinner they had met under the shadow of the loss of Lord Riddell, one of the greatest benefactors the hospital and school ever had; they still sorely missed his inspiring presence and help. In the disposition of his estate he had remembered the institution which had been so near his heart, and the hospital was now beginning to feel the benefit of his generous bequests. Dr. Dorothy Hare welcomed the guests, and replies were made by Dr. Letitia Fairfield and Commander Stephen King-Hall, R.N. Dr. Fairfield said that the London County Council, of whose staff she was a member, had recently entered into competition—which she hoped no one regarded as unfriendly—with the voluntary hospitals. The Council hospitals, like the voluntary ones, were far from being the impersonalized institutions which some people supposed, and the L.C.C. was becoming the recipient of expressions of gratitude which were sometimes embarrassing. Commander King-Hall, in his reply, asked whether the medical profession could not do more to increase human longevity. Man was confined within the framework of time and space, but he did not by any means lie passively within his prison, but was always trying to extend its dimensions and alter its shape. He had done wonderful things with the space factor, not only inventing means of communication, but using the telescope and microscope to make new conquests. He was busy making a larger prison for the next generation. But on the time side the achievements had been much less noteworthy. The shortness of human life in relation to the length of human history and the ever-increasing area and speed of human activity was a factor of immense influence in the affairs of men. Man realized that if he was not to become hopelessly pessimistic he must deceive himself with a kind of spurious immortality, and so he talked of his children's children and his duty to posterity. Since 1870 the expectation of life had increased by about fifteen years. So slight an increase seemed out of proportion to the other advances. Why was the centenarian still a curiosity? Why had no method been elaborated for replacing worn-out pieces of the human body in the same way as parts of motor cars were replaced? Some thirty or thirty-five years of active life was really a beggarly allowance in view of the enormous speed of human activity and the aggregation of knowledge of all kinds. One of the most important factors in the establishment of international peace would be a substantial gift of time. Commander King-Hall suggested that at least twenty millions a year should be spent on medical research. Agriculture and industries were subsidized, why not medicine? The mere allocation of such a sum for the purpose would have a great psychological effect on the community. In reply to the toast of his health, proposed by Dr. Rowland-Jones, Dr. Haldin-Davis said that he had recently ceased to be an active member of the staff of the Royal Free Hospital; he had enjoyed every day of his fifteen years there, and the hospital had done him the honour, which he much appreciated, of making him a member of its staff of consultants.

Tuberculosis in Cardiff

In his annual report for 1934 on the public health department of the city and port of Cardiff, Dr. J. Greenwood Wilson, medical officer of health, submits a statistical study of tuberculosis incidence and mortality which should go far to correct the hitherto prevailing sombre belief that in that city the disease is reprehensibly

rife and deadly. He shows that the death rates from tuberculosis of the respiratory system and from other forms of the disease have fallen in the last forty-one years by 42.6 and 77.1 per cent. respectively. The rate has not declined so rapidly, nor to so low a level, as has that for England and Wales as a whole and for certain other large towns, but he urges that the Cardiff rate is more justly comparable with that of seaports where like conditions occur. The highest death rates are found in those wards of Cardiff where the majority of the foreign-born and other seafarers live, and where in parts there are poor housing conditions and overcrowding. It appears certain that the evil of multiple tenancy has contributed to the relatively high death rate, even though the overcrowding problem is no worse in Cardiff than in many other places with a lower mortality rate. A statistical table showing the occupational incidence of tuberculosis in the city indicates clearly that the disease takes a far greater toll from seafarers than from persons following other vocations. Bad housing conditions afloat predispose to tuberculosis as much as ashore, and Dr. Greenwood Wilson asserts that there is a minimum standard of accommodation "fit for human habitation" which could be attained afloat, and that this minimum is not being attained. There has been a noteworthy increase in the number of vessels arriving at Cardiff in the last few years, both British and foreign, with the crews' quarters in a dirty and verminous condition and structurally defective. In modern steamships the sailor spends more of his time below than was the case with the old sailing ships, and thus the effect of the evil conditions is accentuated. The proportion of persons residing in Cardiff who were born outside the British Isles was shown in the census of 1931 to be 23.9 per 1,000, a figure which is higher by 6.1 than that of any other seaport in the country. It is well known that the death rate from tuberculosis among seamen, especially Arabs, is high, and the proportion of Arabs residing in Cardiff is exceptionally high. There was a large immigration into Cardiff of rural inhabitants during the rapid increase in size of the city between 1850 and 1911, and thus a fertile soil for the disease was already present. Taking such facts into consideration it is deduced that Cardiff's relatively high death rate from tuberculosis is capable of explanation other than along lines applicable elsewhere, and that the campaign against the disease is a more difficult matter than might at first be thought.

L.C.C. Health Services

In view of the anticipated biennial measles epidemic this winter, and of the proved value of serum treatment in the prevention and attenuation of attacks of the disease, the Hospitals and Medical Services Committee of the London County Council proposes to make more extended arrangements in regard to the services of donors of blood, including members of the Council's staff, and it is proposed to make a small payment of five shillings on each occasion to ensure the requisite supply. The total annual cost is expected to be not more than £250 for payments to donors and £100 for apparatus.

The London Education Committee proposes to give the resident and non-resident staff at residential schools and children's homes where active immunization of the children against diphtheria is in operation the opportunity of being Schick-tested, and if necessary immunized against diphtheria. The written consent of the members of the staff concerned, and, as regards minors, parental consent, will be obtained before any action is taken in individual cases. The testing and immunization of the staff is to be carried out in the same way as on children. Medical officers in the schools and homes who undertake the Schick-testing and active immunization against diphtheria of members of the staff are to be paid at the rate of 2s. 6d. for each person treated, unless such immunization work already forms part of their duties. Medical officers with experience of the process of active immunization whose services are utilized for this purpose as may be required, and for demonstrating the technique to the medical officers of the schools and homes, are also to be paid at the rate of 2s. 6d. for each person treated.

Rheumatism Research in Leeds

The first annual report of the advisory committee on research into rheumatism which the University of Leeds inaugurated in association with the Royal Bath Hospital, Harrogate, covers the twelve months ended July 31st, 1935, from the financial standpoint, and a longer period as regards clinical and scientific work. Dr. D. H. Collins, the committee's research fellow, has been working at Harrogate along several lines simultaneously. He has already published a study of the nature and incidence of anaemia in chronic rheumatism based on the observation of 192 patients and a report of rheumatism among coal miners, including a statistical analysis of the records of 500 cases treated at the Royal Bath Hospital since the beginning of 1932. Other work proceeding or proposed comprises an investigation of the neutrophil nuclear count in chronic rheumatism, with special reference to its bearing on the question of focal sepsis; an examination of the pathology, bacteriology, and pathological chemistry of the synovial fluid in chronic arthritis; a study of the bacteriology of the blood in atrophic (rheumatoid) arthritis; and an examination of the alterations in the physiology of the peripheral circulation and their relation to pain in rheumatism. This broad survey of the clinical field in rheumatism was thought to offer the best promise of early fruitful results, and a means of determining which lines should be prosecuted more intensively in the future. The laboratory work has been done in the spacious and well-equipped clinical laboratory at the Royal Bath Hospital, Harrogate.

Scotland

Principal of Aberdeen University

The King has appointed William Hamilton Fyfe, M.A., LL.D., Principal and Vice-Chancellor of Queen's University, Kingston, Ontario, to be Principal of the University of Aberdeen in place of the Very Rev. Sir George Adam Smith, resigned. Dr. Hamilton Fyfe was headmaster of Christ's Hospital from 1919 to 1930.

Edinburgh Royal Infirmary

At the annual meeting of the League of Subscribers to the Royal Infirmary of Edinburgh, held on November 28th, Sir Thomas Whitson, chairman of the Board, in expressing thanks to the league, which had collected £24,572 during the year, said that 20,695 patients had been treated in the wards of the institution, an increase of 850 on the figure for the preceding year. The daily average of patients had been 934. The waiting list still stood at roughly 3,000: an analysis of this list showed that a large proportion of cases required only minor surgical operations, which produced a certain amount of incapacity but could not be said to be serious. To reduce this waiting list, therefore, a scheme had been devised whereby a spare ward, previously used for emergencies and while other wards were being cleaned, would be devoted to these minor surgical cases requiring only a short stay in hospital. A sum of £150,000, Sir Thomas continued, was still required to complete the extension scheme, and it was proposed to issue another appeal to the public. There had been an increase in the ordinary income of £16,000, which, however, was largely due to a change in the accounting system, while the ordinary expenditure had been £300 less on a total expenditure during the year of £156,598. Legacies for ordinary purposes had amounted to £73,199, as against £70,271 in the previous year, while legacies for endowment purposes amounted to £17,197. Mr. Andrew Eunson, honorary secretary of the League of Subscribers, said that it had been decided to urge all members of the league to increase their subscriptions as much as possible, and in particular to ask those who were subscribing one penny per week to raise this to twopence. Questions had recently been asked about the charges

made for admission to the municipal hospitals, and it was proposed to suggest that some equitable arrangement should be made in cases where members of the league were admitted to municipal hospitals. The contributions to the funds of the Royal Infirmary were collective prepayments for treatment which might never be needed, but they were made with the idea that if treatment was required such payments would enable those requiring it to get this service free. When, owing to the long waiting list of the Royal Infirmary, members had to go to the municipal hospitals and pay a minimum charge of 25s. per week, they naturally wished that the contributions they had made to the hospital services of the city should receive some recognition in the municipal institutions. In Aberdeen the municipality found itself able to forgo the revenue from hospital patients, and there seemed no reason why in Edinburgh, where the rates were lower than in any other large town in Scotland, the charge on the sick might not be dispensed with. One penny per £ on the municipal rates would allow of free admission. In England there was a greater degree of co-operation between the municipal and the voluntary hospitals than obtained in Scotland, notwithstanding the fact that in England it was compulsory to charge patients, while in Scotland the question of charging them was optional on the local authority.

Glasgow Royal Maternity and Women's Hospital

The ninth annual medical report of this institution, covering the calendar year 1934, and prepared by the registrar, Dr. Malcolm D. Black, follows the same lines as its predecessors except that, where possible, analyses have been substituted for tabulated lists of cases. During 1934 the admissions totalled 4,528, the average number of patients in the wards being 166. The number of children born in the hospital was 3,224, of whom 2,892 (87 per cent.) were born alive. There were sixty-four maternal deaths, the death rate being 1.4 per cent. Co-operation with the Glasgow Corporation has rendered it possible to continue the policy of not refusing treatment to any woman in labour without increasing the overcrowding of the wards. From the ante-natal dispensary on the hospital premises many cases were admitted to the obstetrical department and to the ante-natal wards; during the year treatment in these wards was given to 1,684 patients, which figure represents 37.2 per cent. of all admissions to the hospital. Since 1930 the ante-natal dispensary has had to be kept open on Saturdays to cope with the increasing number of patients. With this dispensary is combined a post-natal one and an infant consultation (child welfare) centre, at all of which the total attendances during 1934 numbered 22,492. In the year under review 4,472 patients were attended in their own homes; 386 of the cases (8.1 per cent.) were abnormal, and four maternal deaths occurred, a percentage of 0.08. Many emergency cases were sent in to the hospital by medical practitioners and midwives. The total number of abnormal cases in 1934 was 3,081 (68 per cent. of all admissions), and many were emergencies. This fact and the high incidence of rickets in the area served by the hospital indicates that the type of case is often very grave. It must be taken into consideration when comparing the incidence of the more serious complications of labour and the mortality and morbidity rates with those of other institutions where these adverse factors are less in evidence. In the 1,684 cases admitted to the ante-natal wards there were 244 cases of contracted pelvis, 357 of pregnancy toxaemia, 108 of pyelitis, ninety-four of heart disease, ninety-nine of high blood pressure, sixty-nine of threatened abortion, thirty-three of placenta praevia, and forty-three of accidental haemorrhage. The deaths numbered sixteen, including three cases of placenta praevia and one of albuminuria. A total of 611 cases of contracted pelvis were admitted to the whole hospital in 1934; in these cases induction of premature labour was seldom employed. In cases in which spontaneous labour occurred, medical induction was performed twenty-four times with fifteen successes, and surgical induction eight times. Medical induction was employed eleven times with six successes in cases delivered by Caesarean section, and surgical induction twice. In cases terminated by forceps delivery medical induction was used five times with four successes, and surgical induction twice. Spontaneous delivery occurred in 268 cases of contracted pelvis, with no maternal deaths; the stillbirth rate was 5.1 per cent., and the combined pyrexia and sepsis rate 10.4 per cent. In the 128 cases of contracted pelvis delivered by forceps there were three maternal deaths, twenty-seven stillbirths, and six infantile deaths. In five of the stillbirth cases the mothers were suffering from the toxaemia of pregnancy. In the 113 cases of placenta praevia there were eight deaths, four due to haemorrhage, three to sepsis, and one to acute endocarditis and paralytic ileus.

Ireland

Medical Research in the Irish Free State

It is stated that the Government has given its approval to the establishment of a medical research council, and proposes to allocate a sum of not more than £10,000 for the first year's working from the funds of the Irish Hospitals Sweepstakes Trust Limited. The council will be composed of one representative from each of the three constituent colleges of the National University, one from Trinity College, and one each from the Royal Colleges of Surgeons and Physicians in Ireland, and one from the Royal Academy of Medicine in Ireland. Its first care, it is announced, will be the promotion of clinical research in medicine and dentistry. Recently Professor Henry Moore, University College, strongly criticized the backward position of medical research work in the Irish Free State. He pointed out that Dublin had not retained its pre-eminent international position in medical research because, with the modern advances in all the sciences, research had become expensive, and there had been little money for it. "Our international reputation in research can be recovered," he said, "if monetary facilities are rendered available, and money should be now available for this purpose from the sweepstakes funds."

Influence of Alcohol in the Home

Dr. C. S. Thomson, medical superintendent officer of health, Belfast, in an address to the Irish Temperance Alliance on "The Outlook in Child Welfare as Regards Alcohol," said he thought the temperance question was one that could be settled in each family by the influence of personal example, and if each family was wise in its outlook it followed that the nation could reap the benefit. Alcohol was not a necessity; it was taken for its agreeable effects, not for its food value. It was not a true food, since it could not be utilized for repair purposes. While moderate doses adequately diluted and following one another at intervals could probably be consumed by normal people without notable risk, it should be remembered that the drug effect was early operative and the range of safety was narrow. The condition known as chronic alcoholism was due to a general devitalizing action, the signs of which ranged from impairment of function to gross degenerative changes in the human body. The action of alcohol was responsible for gastritis, peripheral neuritis, a certain form of kidney and also of liver disease, and for cerebral haemorrhage. Again, alcohol lowered the resistance of the body to microbic diseases. These facts should be placed with moderation and cool precision before all adolescents, who would then be able to face life well warned of the dangers of alcohol.

Hospital Readers' Association

Viscount Charlemont presided at the annual meeting of the Belfast Hospital Readers' Association, whose aim is "to read stories to sick children and invalids with the one object of helping to pass the time for them." Lord Charlemont said that he could speak with experience of the monotony of hospital life. One welcomed anything to take one's mind off oneself, and though he had never

been read to he could appreciate what it meant to a patient. That was an excellent association, and he hoped it would extend its services. Dr. Robert Marshall of Templemore Hospital spoke from the doctor's point of view. The mind, he said, was capable of only one sequence of ideas at a time; if severe suffering dominated it then it might be impossible to distract it, but a lesser degree of pain could often be soothed and distracted by something different. Apart from pain, however, a sick person was given to self-pity, and patients in hospital were particularly so affected; to have someone sufficiently interested to read to them was very beneficial. There were two classes of listeners in the Ulster Hospital. There were those who, while temporarily disabled, would recover and again pursue their educational career. It was important that their minds should be kept interested, and this could be done by the reading of story-books. Yet more important, however, was the education of those who would never be quite well again and who could not receive a normal education. Juvenile rheumatism, with or without heart disease, was the chief cause of admission to the Ulster Hospital. In Belfast alone large numbers of children suffered from rheumatic heart, and were only fit for about half the ordinary course of education.

Reports of Societies

CAUSES AND TREATMENT OF OBESITY

At a meeting of the Section of Medicine of the Royal Society of Medicine on November 26th, with Sir CHARLTON BRISCOE in the chair, a discussion took place on the causes and treatment of obesity.

Reduction of Intake

Sir EDMUND SPRIGGS, after a few remarks on causes, devoted himself principally to treatment, which he said fell into two parts—namely, reduction of food and increase of energy output. To produce a rapid fall in weight by fasting or partial fasting was easy, but it was not likely to be permanent, and could not be carried on for more than a very few weeks without certain risks. A better way was to supply the basal needs of protein, vitamins, and salts, with some fat, and enough carbohydrate to prevent ketosis, but with a reduction of calories. This was done by giving an ordinary mixed diet, but in quantity lessened by measured steps, always bearing in mind that a certain proportion of protein, providing 6 to 9 grams of nitrogen, was needed daily. The basis of the diet was meat and vegetables, but if the amounts were measured there was hardly any food which might not be allowed, at least in small quantities. It was essential to teach the patient that it was the total caloric value which counted, otherwise he ran away with the idea that some foods were fattening and that others, such as fruit and toast, were not, and that an obese person could be reduced by permitting this and forbidding that, irrespective of amount. Much work must be done day by day and week by week in measuring and varying the diet and making it conform as far as possible to the patient's tastes. No fixed or published diet could therefore be the most suitable for any individual; his regime must be varied continually. The speaker showed a table giving a rough outline from which diets of 700 to 1,200 calories could be prescribed. Enough protein should be secured by taking meat, fish, eggs, or cheese at three of the meals. A milk diet was sometimes used for a time, but people were apt to complain of feeling weak upon it. An "orange day" was useful, say once a week, or if appetite failed. Six large oranges gave 370 calories, with about 70 grams of carbohydrate. Single fruit cures, continued for long, were starvation cures. Water and other suitable fluids might be drunk freely at any time if the food was weighed. If the food was not weighed it was important not to drink till after all the solid food had been eaten, for to drink during the meal led to more food being consumed. Beer, spirits, and wine had a considerable food value, which must be allowed for if they were taken. A glass of beer was equivalent to nearly a round of white bread, as was half a bottle of white wine; and two ounces of whisky was equivalent to two-thirds of a round of bread.

Measures to Increase Energy Output

Turning to the other aspect of treatment, increase of energy output, Sir Edmund Spriggs said that it was to be noted that most of the energy used went to maintain warmth. The loss of heat was proportional to the area of the body surface. Hence the more the body figure approached the spherical the smaller was the surface in relation to weight and the less food was needed. Fat people needed less food than thin. Exposure to cold would therefore be a means by which most energy could be lost, but that method would have its risks. In ordinary muscular work the expenditure of energy, though considerable, was not great as compared with the intake of food. That was why people who went for long walks were often disappointed with the amount of the hoped-for fall in weight. A very little extra food, which the walker felt he had well earned, would neutralize the used-up tissue. Exercise, nevertheless, was a valuable means of losing weight, and might make the difference between a plus and a minus balance. When it was combined with loss of heat from evaporation of sweat the results were likely to be better. Riding was good, but had to be fairly hard to be as effective as walking, and especially walking uphill. The Bergonié chair was useful to exercise the muscles of people unable to take long walks, such as those with disorders of the joints. The direct value of massage as a means of keeping weight down had not been demonstrated so far as he knew, but, like other forms of physical treatment, it was of great value in improving the local circulation and keeping the body fit whilst a reduction diet was being followed. Of drugs thyroid was by far the most useful, but health might be seriously impaired and habit formed under its uncontrolled use.

Under such a regime most people felt better and lighter at once. In some cases the benefit was very great, and a new life was opened out. He gave particulars of 550 patients who had been treated for obesity at Ruthin Castle, in particular of 100 without complications and 100 with complications. The total loss of weight in these 200 cases was just upon one and a half tons! For a successful rapid reduction of weight that was likely to last, special cooking, a variety of food, consideration of individual taste, and relaxation of diet at times, for medical reasons, were needed. When the weight had been brought down to a reasonable figure for the height a person of ordinary wit and restraint could keep it from rising again. There was no need to make a fuss about being on a diet, or to disturb a household or a hostess. Suitable food was found on an ordinary table. The problem was now one of omission of unsuitable foods, not of special cooking, and the restriction of carbohydrate was the key to the situation.

Causes of Obesity

Dr. H. GARDINER-HILL said that there was no doubt that the obese patient did have the greatest difficulty in keeping his weight under control on what he regarded as, and what seemed to be, an average normal diet. He had only to take a slight excess of food and he immediately began to store it. In some cases obesity could be traced to excessive consumption of alcohol. In some it developed after residence in a hot climate, probably deriving from increased thirst and diminished energy expenditure. Perhaps in a hot climate there was some lower setting of the heat-regulating apparatus connected with the functions of the thyroid and renal glands. Often there was a hereditary tendency to obesity. Many of the patients presented signs of endocrine disturbance in a minor key. In the obese the regulatory apparatus was in some way disturbed. The majority had somewhat excessive appetites and were generally less inclined to exert themselves. But there must be something else: the essential difference between the fat man and the thin seemed to be the extraordinary avidity of the tissues for food and salt and water. One wondered if even gross

abnormalities of the regulatory mechanism could result in obesity unless there was some peculiarity of the storage mechanism, which peculiarity might be inherited or acquired as a result either of excessive food intake or diminished energy expenditure, or changes of climate, or endocrine disease. There was little evidence that endocrine deficiency was the basis. The excessive storage mechanism was much more likely to be due to some overactivity in the anabolic endocrine apparatus than to any defect in the katabolic. Destructive lesions of the thyroid or the sex glands might produce obesity, but not always. One frequently saw patients with myxoedema who were not at all fat. Obesity might be found with a low, moderate, or high basal metabolism, with a decreased, normal, or increased sugar tolerance. Finally, obesity, especially in certain forms, was accompanied by water-salt retention. That storage powers depended on the endocrine mechanism must be admitted, but it must also be admitted that there was complete ignorance of the nature of such dependence, and further light would only be thrown on the subject when hormonal influences controlling the storage were better understood.

Relation of Obesity to Food Consumption

Dr. Donald Hunter described how a systematic reduction of weight had been undertaken among patients who came up complaining of obesity to the out-patient department of the London Hospital. The number referred to the dietetics department for gross overweight during the period 1927–35 was 2,447. Reasons were explained to them why they should attend for weight reduction by dietetic means, but half of them never came again and others attended only twice, and only 682 in the nine years attended with sufficient regularity to have their cases put on useful record. Of this number 262 came up with obesity only ; in seventy-three hyperpiesia was associated ; in seventy, arthritis ; in seventy, diabetes ; in thirteen, emphysema ; in twelve, heart disease ; and in forty-two there were other medical conditions. The remainder were associated with surgical conditions or came up on the obstetrical and gynaecological side. Of those individuals who submitted to the regime ninety-three lost weight, and he had made a rapid calculation that the total loss of weight among these East End ladies—the great majority of the patients were women—amounted to twelve tons! The great practical problem was to persuade medical students, the doctors of the next generation, that the law of conservation of energy was applicable to the human body, fat or thin. It was also difficult to persuade the patient that weight could be reduced by dietetic means only, and that this could be done without illness or the necessity to give up work. No drugs had been used in this series. The loss of weight aimed at should not exceed two pounds per week. A suitable reducing diet for a man of optimum weight contained approximately 1,100 or 1,200 calories. The reason why these people gained weight, although they claimed that they ate less at meals than anybody else in the house, was because they ate between meals. The alcohol problem was also difficult, much more so in private than in hospital practice. If a doctor referred a case in private for obesity with a letter that the patient would not consent to cut down her cocktails or sherry one might as well send her back. The real difficulty was the psychology of the obese who were self-indulgent enough to break the diet.

Dr. E. P. Poulton mentioned the case of a woman patient, bed-ridden, with a certain amount of rheumatoid arthritis, whose weight was 13 or 14 st. He decided to reduce the fat, and she was given a diet of 500 or 600 calories. She responded to this treatment, and reached a weight of 10 or 11 st. The diet was then increased to 700 or 800 calories, and the weight remained constant for a year. Not everything was known about obesity at present, and possibly people did need a good deal less food than was apparent from measurements.

The Endocrine Factor

Dr. Levy Simpson said that he wished he could regard obesity, as Dr. Hunter did, as simply a question of the amount of excess food taken in. He urged that there was no such thing as simple exogenous obesity if by that was meant an exogenous obesity in which there was no underlying endocrine factor. Before endocrine factors could be excluded it was necessary to exclude pathological appetite. Obese people, particularly of the pituitary type, frankly confessed that their hunger for sweet things at times amounted to an absolute craving. Very often this occurred just before menstruation. This on the face of it was obviously an exogenous obesity ; it was so in one sense, but it had a pathological basis behind it. The association of somnolence with gross obesity was well known, and he thought it also occurred to some extent in less gross forms. There was among certain obese types a great tendency to spare themselves effort in many ways. The fact that a basal metabolism was taken once and found normal did not mean that the metabolism was always normal. He was not so sure that the law of conservation of energy did hold in any simple way. He instanced the case of an actress, whose living depended upon her maintaining a certain slimness. She kept on a limited diet and went to such lengths to repress her tendency to stoutness as to have her breasts removed in a plastic operation, yet she could not keep down her weight. It was evident that there were in such cases factors not easily understood. There were such things as constitutional adiposity, familial adiposity, and racial adiposity. There might be also an endocrine basis to a racial factor. When all the facts were assembled the subject was exceedingly complicated, and endocrinology must be acknowledged to play a large part in it.

Dr. Leonard Findlay said that his experience among East End children led him to a diametrically opposite conclusion to Dr. Hunter. It was a fallacy to say that this question turned upon food intake. Individuals varied tremendously in their response. He was positive, from investigation among children, that excessive diet was not the main factor. He thought they should cease to talk about exogenous adiposity. If such a thing did exist every one of them would be obese, because every one was taking more nourishment than he actually required.

Dr. F. Parkes Weber suggested that the goal to be aimed at in the future was to discover some method of reducing appetite without, on the one hand, doing harm to the obese person or, on the other, diminishing the pleasures of existence. Dr. H. W. Hales said that obesity might be regarded as a symptom of oxygen deficiency produced by tissue and intestinal poisons. Prolonged fasting cleared up a number of pathological conditions, and was not followed by a return of voracious appetite or by the regaining of undue weight. He also mentioned toxic principles in food, especially meat, and said that these toxic bodies, which became fixed in the tissues, could only be eliminated by very low diets.

NULLITY AND IMPOTENCE

At a joint meeting of the Medical Section of the British Psychological Society and the Medico-Legal Society a discussion took place on nullity and impotence, at the Institute of Medical Psychology on November 20th, with Dr. Emanuel Miller in the chair.

Dr. E. A. Bennet said that the medico-legal conception of impotence in relation to nullity was still not clearly defined. Writers on the subject had hardly noticed the work of the psycho-pathologists. In functional or psychical impotence an examiner could find no physical defect, but in a woman it might show itself in such observable changes as vaginismus and genital hyperaesthesia. If irremediable and not disclosed, it should give ground for annulling the marriage. He quoted the words of McCann that a medical witness was not justified in diagnosing impotence if there were no apparent physical defect, and of Glaister (a Scottish author), that mental causes did not rank as causes of impotence from the medico-legal aspect. Nevertheless, he said, in law a marriage could be annulled for any cause which acted as a barrier to coitus. A decree could be given against a man who was only impotent *quoad* his wife and not other women. Such a condition was usually called

relative impotence, but Dr. Bennet suggested that a better term would be "selective" impotence. He considered that a medical witness might make a dogmatic statement on impotence even though he found no injury or defect. Friction in the complex series of relationships which constituted marriage might be easy or difficult to treat, but if unchecked it led to strain and incompatibility. Impotence might be found at any stage, and, according to Adler, was traceable to faulty training in relationships with others. It was never a single symptom, and if no other neurotic symptoms were found it could not be safely diagnosed. In most cases, with proper treatment and a co-operative partner, impotence could be cleared up. When legal proceedings were suggested, however, the new element of disturbance might well prevent cure, for the patient's humiliation was made public and his wife would no longer co-operate.

Dr. ADRIAN STEPHEN said that, considering how complicated a matter the development of sexual potency was, it seemed more necessary to explain why anyone achieved it than why a particular person failed. In young children urination was closely identified with the sexual act; it was also a symbol of aggression, and, if this significance were continued into adult life, sex was associated with aggressive instead of with love feelings. Similarly, an infant frustrated in suckling might develop fear and hatred of the breast. Anything which interfered with the earlier physical expressions of love might have disastrous effects on the later. Potency might be inhibited by an unconscious fear either that the object would retaliate or that it might be soiled or injured. The man might divide women into the idealized class with whom intercourse was impossible, and the degraded class whom it was permissible to hurt. The unconscious fear of a rival was another inhibiting factor, the fear being usually directed to a parental image.

The Legal Aspect

Mr. GEOFFREY TYNDALE said that the possible scope of the medical man in nullity suits was small. In persistent and wilful refusal by a wife the husband was in the position that his petition was dismissed, and his only solution, in practice, was to send her a hotel bill. He then got his freedom, but she got one-third of his income for their joint lives. Deliberate persistent refusal should be made a ground for nullity without any need for the court to infer incapacity. Time and again, if the lawyer could get medical help he would receive it with open arms. His footsteps were, however, continually dogged by "medical privilege." The doctor attending the party supposed to be impotent would not make a statement beforehand, and counsel dared not serve a subpoena on him.

Mr. S. E. KARMINSKI remarked that physical defects were rare in nullity suits. Medical inspectors—especially in undefended cases, where they only saw the petitioner—were usually only able to make a negative report: they could state whether the woman was or was not a virgin, and that the man was apparently fit. Thus counsel presenting the case could show nothing about the respondent, or nothing visibly wrong. The court had therefore to perform a difficult duty. It would, however, fairly readily assume that one or other of the parties was impotent, and was quite willing to recognize psychic causes as the root of most impotence. A judge could grant a decree to both parties if he could not determine which was the impotent one. Among some interesting suggestions based on the stories of petitioners as to why the marriage was never consummated, Mr. Karminski included disgust in the wife at anything sexual, a confusion of the sexual act with the excretory functions, or a simple dislike of being touched at all. He found that a common cause of impotence in a man was masturbation, the psychological effects of which tended to make him self-centred and disinclined to take trouble. Other men who had contracted venereal disease—which might even have been cured—became impotent from fear of infecting their wives. Then there was the general hysterical type of either sex who became helpless from mere excitement, and a man might be impotent through anxiety at not being able to perform the sexual act. In practice, the courts would often infer from wilful refusal, accompanied by violent resistance, an actual inability to consummate the marriage.

Dr. H. CRICHTON-MILLER inveighed against what he termed the invalid assumption by lawyers that impotence and virginity were absolute conditions, and that they could be objectively established about either partner. Mr. Registrar NORBURY, after some general remarks on the law, considered that it worked quite smoothly at present, and that hard cases made bad law. Dr. S. HENNING BELFRAGE said that the medical inspector had to steer his way carefully between his medical and his legal instincts. He had to furnish a report, but could not go beyond the external appearances. He therefore had sometimes to certify that a husband was apparently capable when he knew that the man could not perform the act with his wife. The court was only interested in impotence in the selective sense. In his private capacity he could often form a definite opinion as to where the fault lay. The incidence of impotence seems to be nearly equal: about fifty-five men to forty-five women. The causes in men included refusal to attempt, based generally on some moral ground or the fear of having children. Some men wished to have intercourse but felt no desire, or felt desire but had no erection, or premature ejaculation. Many wives refused deliberately, or resisted violently with emotional disturbance; sometimes any penetration was severely painful. Both parties might be desirous but physically incompatible. The great majority of impotence was, he agreed with Dr. Stephen and Mr. Tyndale, based on mutual difficulties, often due to ignorance. How far the medical inspectors would be able in future to help the court on the psychological side it was difficult to say. These cases were numerous and were hurried through, and it became impossible to arrive at a fair decision.

CINERADIOGRAPHY

At a meeting of the Liverpool Medical Institution on November 14th, with the President, Dr. C. O. STALLYBRASS in the chair, Dr. RUSSELL J. REYNOLDS gave a lecture demonstration on cineradiography.

Dr. Reynolds detailed his method of obtaining cinematographic records of *x*-ray pictures by means of photographing the screen image; he described his early experiments, and then enumerated the conditions necessary for a successful result. A 16 mm. cinematograph camera was used. It was only necessary to take a short length of film of any one subject, and this could then be formed into a band and run through the projector continuously, so that the cases could be studied at leisure. Thus, the expenses of operating the apparatus could be reduced to a minimum. Exposures of various parts of the human body had been made: the joints, movements of the heart and thorax, the act of swallowing, and the passage of an opaque meal through the oesophagus, stomach, and duodenum had all been demonstrated satisfactorily. Dr. Reynolds then described the apparatus he used, and explained the details of its manipulation. He concluded by alluding to the numerous possibilities which this new method held as regards the diagnosis of pathological conditions and the study of physiological problems. He then showed a number of films which he had taken of various joints and organs of the body.

In the discussion Dr. R. E. ROBERTS commented on the very successful way in which each technical difficulty had been overcome as it arose, and on the high quality of the radiographs obtained. Far from there being any graining or blurring, such as one would expect from photography of a screen image, many of the pictures were as clear as if they had been made under the most favourable conditions of direct radiography. The maximum utility of the method appeared to be in radiography of the thoracic contents. The wealth of information regarding the cardiac movements obtainable from a cineradiograph of the heart should be far in excess of anything hitherto possible.

Malignant Effusions

At a pathological meeting on November 21st, Dr. R. Y. DAWBARN read a paper on malignant effusions.

Dr. Dawbarn said that the examination of peritoneal fluid or pleural fluid for cancer cells need not be abandoned as a hopeless task. It was certainly almost impossible to recognize these cells in stained dry films, since the endothelial cells caused confusion, but many good results might be obtained by the comparatively old method of cutting paraffin sections of the centrifuged deposit. After centrifuging the fluid in a large tube (about one inch in diameter with a round bottom), the supernatant fluid was poured off, and the deposit was washed in saline solution. The centrifuging was repeated if necessary. The saline was then replaced by Zenker's solution, and the deposit was carefully separated by a platinum wire from the bottom of the tube without breaking. The deposit was left in the fixative overnight, after which it was treated with iodine in 50 per cent. alcohol, dehydrated, and embedded in paraffin. Sections were then cut, and might well be stained with Weigert's iron haematoxylin. Tumour cells might be recognized by various criteria: (1) they might be found in clumps, reproducing gland acini or the solid alveoli of carcinoma ; (2) mitotic figures were an important, though not infallible, sign of tumour cells ; (3) tumour cells often had hyperchromatic nuclei, and might be far larger than any endothelial cells ; (4) karyorrhexis was common in tumour cells, but rare in endothelial cells ; (5) vacuoles occurred both in endothelial cells and tumour cells, but in the latter they might be very large and irregular in shape. Dr. Dawbarn showed sections illustrating the above points, including one made from the ascitic fluid of a case of Hodgkin's disease: a mitotic figure could be seen, apparently in an endothelial cell, which must be very unusual.

CORRESPONDENCE

Risk of Explosion in Operating Theatres due to Static Electrification

SIR,—The Medical Research Council has requested the assistance of the National Physical Laboratory, through the Department of Scientific and Industrial Research, to look into the subject of the electrification of equipment used in operating theatres. Electrification by frictional means, producing considerable static voltages, is regarded as a very serious risk in America ; and, though the risk appears to be much less in this country, in which the atmosphere is not so dry, one or two serious explosions of anaesthetic gases have occurred, which have been ascribed to sparks due to the sudden discharge of electrified equipment.

The importance and want of definite knowledge on the subject has induced the Medical Research Council to ask for more information on the nature of the risk and on possible methods of prevention. The inquiries which have so far been made have shown that the staff of operating theatres have occasionally received uncomfortable electric shocks from such apparatus as anaesthetic couches ; which experiment has shown can become electrified to such an extent that the discharge in the form of a spark is sufficient to ignite an anaesthetic such as ether and oxygen. There is also the possibility of electrification being generated by the use of modern anaesthetic apparatus. It has been found that the staff of operating theatres are likely to experience cases of electrification which do not come to the notice of the medical staff, as their duties are more likely to include the movement of blankets and mattresses, etc., which may give rise to electrification.

Superintendents of hospitals are invited to collect information of electrification of this nature, and to forward it to the laboratory to assist in determining the conditions in which it may arise, and the means by which it may be avoided. Such information should be addressed to: The Director, The National Physical Laboratory, Teddington, Middlesex. Similar information from private practitioners would also be welcomed.—I am, etc.,

J. E. PETAVEL,
Director.

Teddington, Dec. 2nd.

Medical Assessors

SIR,—In the *Journal* of November 16th there is an interesting letter from Mr. John Shiel, barrister-at-law, in which he draws attention to the perplexities in which a court is left after listening to the opposing evidence of expert witnesses ; he contrasts the effect on the lay mind of the dogmatism and scepticism of one authority with the hesitancy of another, and he cannot understand why, when unanimity so often occurs in private consultations, the same should not obtain in a court of law, when it is remembered that the experts are the leading exponents of a science which yearly grows more exact. He considers the marked disagreement in court as a scathing reflection on this science, and goes on to say that the very necessity for appointing medical assessors argues a disinclination on the part of the witnesses to mould their views *on a basis of fact*.

Unfortunately, in so many cases which come to litigation, facts which may or may not be present cannot be relied upon as incontrovertible evidence of the amount of function present, and the possibility as regards function in relation to such facts as may be present opens up a wide field, which cannot be measured scientifically. In a private consultation in a case of sickness not only are facts present and their values measurable to a great extent scientifically, but the symptoms can usually be accepted as reliable. This is not so in cases of injury which become the subject of court claims, and consequently, unless one is in a position to prove that the symptoms complained of, and which are considered by the injured person to be incapacitating, cannot possibly exist, or be present to such a degree as to be incapacitating, even though the facts may suggest definitely function to be good, one cannot, or should not, be dogmatic in the opinion expressed, and expert medical evidence will always explore the possibilities from opposite standpoints.

For instance, Mr. A. has had an injury to his foot which has resulted in the fracture of one or more bones (verified by *x* ray), which have united happily and which, in the normal course of events, should have resulted in full recovery of function in seven or eight weeks. Six months elapse and he still claims that he is totally incapacitated, unable to bear any weight on the injured foot at all because of pain, and actually walks with the aid of a couple of sticks.

The facts in this case are: (*a*) the presence of an apparently normal foot, and (*b*) the apparent inability of the injured man to use the foot on account of the symptom —which may or may not be a fact—of pain. Surgical science should enable expert authorities to agree as to (*a*), but the value of (*b*) cannot be measured accurately by any such science so far as I know. In this case one authority might take the view that the symptom pain was not a fact at all, and state that there was in his opinion no possible cause for such pain, and that therefore the man could, if he wished to do so, walk normally, and should have been able to walk normally for a long time. Another authority may take the view that as the result of prolonged rest and lack of after-remedial treatment the intrinsic muscles of the foot had atrophied, and that any attempt at usage at this stage would be painful, and

that therefore the man was totally incapacitated ; or, again, that his reaction to his injury was partly due to this cause and partly psychological, but none the less incapacitating. In other words, one authority believes the man's contention and the other does not ; hence all kinds of possibilities are advanced and the case gets twisted into theoretical knots, to the bewilderment of the judge and the lay mind, with the result that the tendency must be for medical evidence to be ignored, except in so far as a particular witness may happen to sound more convincing than another.

The medical assessor is in exactly the same position so far as surgical science in relation to (*b*) is concerned, though he may be able to help the judge as to the value of some of the evidence tendered and correct some false impressions resulting from hesitating admissions on the part of a witness in answer to counsel, who, more often than not, appears to delight in confusing a witness, with a view to making him say something which is not intended and for the purpose of destroying the value of the rest of his evidence. Function or capacity cannot be measured accurately by surgical science. The function of a limb cannot be assessed by the amount of movement at a joint, by the presence or absence of deformity, by the measurement of muscle bulk, or by the presence or absence of normally functioning nerves. There is always the factor of pain to be considered, which is a symptom and not an observable fact, but a very important factor in relation to function, and until surgical science can assess pain at its proper valuation there will always be expert authorities taking opposite views and expounding diverse theories in a court of law, because they have not been able to obtain proof of function, without which dogmatism in many cases is unwarranted.

Is there any means by which this proof could be obtained, and these miserable exhibitions in court eliminated, which leave such a bad taste in the mouths of the lay members of the court, who are apparently unaware of the great difficulties surgical science is confronted with, to say nothing of the feeling of having taken part in a very distasteful business, which the honest medical witness must always be conscious of? The function of a limb or part rests on its ability to perform stresses without discomfort. Maximum function is the ability of a limb or part to perform all its accustomed movements normally, and to stand up to all normal stresses with full freedom of movement and normal power without discomfort. I believe that such proof can be obtained in many cases of injury in rehabilitation centres, the setting up of which has been one of the suggestions of the Fractures Committee of the B.M.A. Such centres, properly organized and conducted, would, after a period of treatment in which increasing activities and stresses are carried out under medical supervision, provide the clinical evidence of function in a way which could not possibly be obtained by any single examination by an expert authority.

I foresee the time when, subject to the necessary amendment of the Workmen's Compensation Acts, such centres might become the judgement halls for the assessment of the various disabilities, where cases of injury would be seen and examined by an officially appointed board of experts, who would have at their disposal the clinical facts in relation to function recorded from day to day. The medical referee would disappear, and the only cases which would appear before a judge would be those of appeal against the findings of the board. In such cases the judge would have before him the reasoned opinion of the board, together with evidence of fact in relation to function, which he seldom, if ever, obtains in court to-day.—I am, etc.,

Crewe, Nov. 26th. H. E. MOORE.

Congenital Pyloric Stenosis

SIR,—In their article on congenital pyloric stenosis in the *Journal* of November 30th (p. 1037) Mr. W. A. Thompson and Dr. W. F. Gaisford describe a method of medical treatment. They recommend gastric lavage with saline rather than with sodium bicarbonate solution because, as they rightly remark, alkalis are likely to cause alkalosis. On the other hand, it must be remembered that lavage removes hydrochloric acid from the stomach and is itself likely to cause alkalosis even in the absence of vomiting. For this reason it is wise to leave a few ounces of saline in the stomach after lavage.

With regard to parenteral fluid, this is administered with the object of restoring blood volume and compensating for chemical abnormalities of the blood. Owing to vomiting, blood chloride is nearly always low and blood bicarbonate high. The administration of simple salines relieves dehydration and alkalosis and restores the blood chloride to normal, with a corresponding improvement in the clinical condition. While it is true that Thompson and Gaisford recommend salines, they unfortunately recommend blood transfusion or the administration of glucose solution or Hartmann's buffer lactate solution as alternatives. The use of the first is unnecessary, while the use of the others is to be deprecated, because although they relieve dehydration they leave the alkalosis unaffected. At the Infants Hospital, Westminster, one pint of normal saline was always given to pyloric stenosis cases in the two days preceding operation, and the decrease in the immediate mortality was striking, while post-operative collapse became much less common. —I am, etc.,

London, W.C.1, Dec. 2nd. MONTAGUE MAIZELS.

Treatment of Disseminated Sclerosis

SIR,—In Dr. W. Russell Brain's article on disseminated sclerosis, in your issue of November 23rd, reference is made to treatment by artificial pyrexia induced by the subcutaneous and intravenous injection of foreign protein and by physical agencies, the intravenous injection of " pyrifer," a *B. coli* vaccine, being recommended.

I have myself had the opportunity of observing a series of twenty-five cases of disseminated sclerosis treated by intravenous or intramuscular injections of " neuroyatren," a combination of autolysates of *B. prodigiosus, Staphylococcus aureus,* and *B. pyocyaneus* with yatren. Buschmann (*Med. Klinik,* 1924, xxi, 782) used this product with considerable benefit in forty cases of disease of the central nervous system. Paulian (*Paris Méd.,* February 13th, 1932, p. 145) found it more satisfactory in disseminated sclerosis than T.A.B. vaccine, vaccineurin, and pyrifer on account of the more controlled temperature reaction and the practicability of giving a large number of injections and repeating the course, if necessary, after a period of rest.

In the majority of the twenty-five cases referred to there resulted either amelioration of the symptoms or arrest in hitherto progressive cases. A dose of 0.1 c.cm. intravenously or 0.4 c.cm. intramuscularly was commenced with in these cases. It was found possible in most instances to allow the patients who were able to get about to do so with safety after spending the rest of the day on which injection was given and the following day in bed, thus avoiding the risk of the ambulant patient getting worse, as has been observed following unduly long and continuous confinement to bed. —I am, etc.,

Birmingham, Nov. 23rd. S. SILVERMAN, M.D., B.Sc.

Sputum Testing in General Practice

Sir,—May I draw your attention to a crusty but important subject, of which I, as one who does "locums" in sanatoria and in general practice, have the advantage of seeing both sides. At every sanatorium one comes across many patients who have been treated by their own doctors for months, sometimes for years, before their sputa were examined and they were found to be suffering from pulmonary tuberculosis. To-day, for instance, I examined a man who for three years intermittently attended his doctor for cough, was told that it was due to cigarette smoking, and only had his sputum examined when at last he had a brisk haemoptysis. This is quite a common type of history. It leaves one humiliated and indignant. After all these years we are still not making anything like full use of Koch's discovery.

Then, when one goes into general practice the reason, a totally inadequate one, becomes apparent. It is not incompetence, nor is it ignorance. It is the doctor's fear of raising in the patient's mind, and in that of his family, the prospect of a first-class calamity. So he gives a bottle of "mist. expect.," mutters a few platitudes about "catarrh" or "a touch of bronchitis," and, ostrich-like, leaves the tubercle bacillus to go on with its sexton's job of excavation. Whereas all he need have done was to hand over a small glass jar (without the label that indicates that it is going to be examined for tubercle), with some such formula as "I think we ought to find out what germ is causing this cough of yours."

A year or so ago in doing a "locum" in a large rural practice I subjected every case of cough of over a month's duration to a sputum test. The result was eight "new" cases, including two septuagenarians, both of whom had been attending for years, and one of whom had apparently infected his son and grandson. I have no doubt that if we had a "tubercle week" after the manner of our "rat week," and we bombarded both doctors and laity with posters and pamphlets, containing some such slogan as "Any cough of over a month's duration demands a sputum test," or "If you have a cough have your spit examined. Be on the safe side," then thousands of useful lives might be saved or at least prolonged.

One cannot help thinking that if patients were as litigious over neglected tubercle as they are over failure to use *x* rays in cases of suspected fracture it would be an excellent thing for the health of the nation.—I am, etc.,

November 26th. C. G. L.

Tuberculosis Among Students and Nurses

Sir,—The startling contents of the letter from "An Old Resident" (November 30th, p. 1072), following the annotation on tuberculosis among students and nurses (p. 957), emphasizes the urgent need for ventilating an important subject. That medical students run a greater risk of developing tuberculosis has been shown abroad by several investigations, which not only give the incidence but also suggest the responsible factors. The main purpose of such investigations, however, should be the detection of the disease at an early stage; and with this object in view the routine periodic examination of medical (or all) students is now practised in several American and Continental centres.

The treatment presents other than medical difficulties; for few students can afford admission to a private sanatorium, and a long stay in a public institution may prove a hardship owing to social and educational differences. Moreover, the patient's studies are markedly interfered with; and, finally, in the case of medical students it is important that treatment should be prolonged in view of the greater risk of contact and the irregular existence which the practice of the profession entails. It is realization of these aspects of the problem which led to the foundation, three years ago, in France of a "Sanatorium des Etudiants." The scheme was initiated in 1925 by the Union Nationale des Associations Générales d'Etudiants, and most of the original cost was defrayed by the State. Although on the same footing as other public sanatoria, the institution is reserved for university and college students and graduates. This modern and fully equipped sanatorium is situated 3,750 feet above sea level facing the Alps near the famous University of Grenoble, and has 180 beds, of which thirty are for women. The most important feature of the institution is that it enables the patients to continue their studies as a result of the following arrangements: (1) Lectures and courses are given by teachers from the adjoining university. (2) Students making a very long stay may transfer to the corresponding faculty at the University of Grenoble. (3) Ample technical libraries are provided. (4) Laboratories, a lecture hall, and studies are available. The inclusive cost is 40 francs per day (about 10s. 6d. at the present rate of exchange); but this does not hinder any student from being admitted, for arrangements exist by which the cost is refunded by the municipality to which the patient belongs, as in the case of other tuberculous patients. A sanatorium on similar lines exists, I am told, in Sweden.

In this country it is gratifying that an attempt to tackle the subject has been made in the Prophit Trust Scheme. It is proposed to investigate the medical students at University College Hospital and in Cardiff, and Professor Lyle Cummins has already given some figures of the first year's work. But should not this important problem be tackled on a larger scale? Perhaps a good beginning would be made by enlisting the support of the deans of the large hospitals in London and the provinces, who may be in a position to give the numbers of students and housemen that have had to interrupt their work owing to tuberculosis. Such an investigation would give a justifiable basis for the really important work—frequent routine examinations and the foundation of one or more institutions similar to the one I have described. Will the initiative for such a campaign come from the older members of the profession or must it come from the students themselves?—I am, etc.,

London, N.W.1, Nov. 30th. G. Gregory Kayne.

Sir,—"An Old Resident" draws attention to a state of affairs which is a slur upon our hospital system. He emphasizes the fact that the living conditions of the residents in a London teaching hospital are very unsatisfactory. I would go further than this and state that in my opinion such conditions are not confined to one hospital but are characteristic of all. Governors of London teaching hospitals who allow the present state of affairs to continue are taking an unfair advantage of young doctors. A resident in such a hospital is overworked, underpaid, and harassed on all sides by patients, patients' relatives, honorary staff, ward sisters, and students. He gets little fresh air and less exercise, while his lack of sleep is chronic. He is often on duty for twenty-four hours a day, and even when off duty is liable to be woken during any night. Surely it is agreed that this life is unhealthy. Surely it is agreed that men living this life must become tired, devitalized, and vulnerable to certain infections. And how much more true is this when the men work always among disease and suffering and death in return for little thanks and less pay.

The facts quoted by "An Old Resident" as to the incidence of tuberculosis among hospital residents are not exceptional: they are the rule. Of the nineteen men resident in another teaching hospital, not more than three complete their term of office without being absent on sick leave. In the production of this ill-health I consider that continued lack of sleep is an important factor.

Hospital governors do nothing in the matter on the grounds that no organized and official complaints are received—surely an ignoble reason for not instituting reforms which are long overdue. In some walks of life reforms never are begun until organized and violent agitation makes them unavoidable. Will the governors of teaching hospitals take the matter in hand before this undignified state of affairs arises? The residents have done their part by enduring for years, and without complaint, working conditions which would never be tolerated by "working men." If the governors will do their bit now they will show their magnanimity thereby, and demonstrate the humanitarian motives which should actuate all hospital authorities.—I am, etc.,

London, Dec. 1st. ANOTHER OLD RESIDENT.

Migraine

SIR,—I was interested in the recent correspondence on migraine. Dr. Horwitz's assertion that paroxysmal diuresis confirms the suggestion that swelling of the brain is responsible for the symptoms cannot, I feel, be accepted. Critchley, in a series of investigations, has shown that a constant change in an attack of migraine is a fall of cerebro-spinal fluid pressure. If the brain were swollen by virtue of oedema, the reverse effect would occur.

The old theory of swelling of an imprisoned pituitary gland as cause of headache has surely been abandoned? The presence of a thick fibrous or calcified roof of the pituitary fossa is by no means uncommon in patients who do not suffer from migraine, and although the theory may be attractive in relation to those headaches which coincide with menstruation, yet it is valueless in explaining migraine in men.—I am, etc.,

London, W.1, Nov. 28th. A. H. DOUTHWAITE.

Inexpert Radiography

SIR,—The letters on this subject by Mr. A. P. Bertwistle and Dr. W. Watson are useful in showing the point of view of practitioners whose work lies in small country hospitals.

The peripatetic radio-diagnostician comes in for severe handling by Mr. Bertwistle. (1) He comes only once or twice a week; (2) he has no time to see patients, clinical notes, etc., when he does come. To take the second objection first, it must be admitted that it has force. But is the "stationary radiologist"—by which term I presume he means a man with one large hospital appointment—necessarily in better case? Apart from barium meal work, too often he also has time only to look at films. The obvious remedy is more radiologists; but this raises economic problems which cannot be discussed here.

Now to take the question of waiting for a diagnosis. Apart from fractures, I cannot agree that the majority of patients sent for *x*-ray examination are in more urgent need of *x*-ray reports than they are of pathological reports; and for the latter a two or three days' wait is quite usual. We do not hear of the local doctor making a hasty microscopical diagnosis because there is no pathologist on the spot. Yet he has had compulsory training in pathology while a student, but, for the most part, no serious instruction in *x*-ray diagnosis.

It is for this reason that short post-graduate courses such as are given on bacteriology, ophthalmology, etc., are of little use in *x*-ray work—no foundation has been laid on which to build. Nor can the matter be remedied until diagnostic radiology is placed in the curriculum on the same footing as pathological diagnosis. Only general principles need be considered, but this would be quite sufficient to enable practitioners who had been so instructed to understand a radiologist's report, and also to realize what type of film they might hope to interpret for themselves. Fracture interpretation should be taught in some detail, as fractures are real emergencies. On the other hand, the use of radiology as an aid to the diagnosis of disease of bone is a matter for experts. Anyone who will study such a book as J. F. Brailsford's work *Bones and Joints*, with its hundreds of pages and scores of illustrations, can have no illusions on the matter. It is surely worth waiting a few days for an authoritative interpretation rather than risk an unnecessary amputation. And the same remark holds for doubtful duodenal ulcers, imaginary gall-stone shadows, and renal calculi which are possibly only calcified glands.

At the same time one must admit that there is a difference between *x*-ray diagnosis and the interpretation of radiographs. The latter process has definite limitations, and is comparable with a report on a microscopical slide. The true *x*-ray diagnosis must take account of history and clinical findings, as well as concern itself with what is shown or not shown in radiographs. In many cases, however, radiographic interpretation and *x*-ray diagnosis coincide—then interpretation *is* the diagnosis, as in characteristic renal stone. Where the radiologist has not time to see the patient he can usually state the most probable diagnosis, and mention the other possibilities. It is then for the clinician to decide. He may not receive all the help he could desire, but at least he will not be misled by false information.—I am, etc.,

London, W., Dec. 1st. F. HERNAMAN-JOHNSON.

SIR,—The writer of the letter appearing in your issue of November 23rd signed "Radiologist" is doing a real service in drawing attention to the amateur *x*-ray work which is now so prevalent. It would appear that the reason for this is the improvement in apparatus, which makes the taking of radiographs of sorts no more difficult than using a Brownie camera.

Some medical practitioners seem to think that a good quality radiograph means a good radiologist: this is no more correct than to think that a good microscopical slide indicates a good pathologist. The whole difficulty of the examination, and the only part that matters, is the interpretation of the findings, whether from the film or from the screen examination. The pitfalls are many. Although I have been a radiologist for more years than I like to think about I still have much to learn about the numerous deviations from the normal, to say nothing of pathological lesions. Inexpert radiology would not matter so much if it were not for the fact that it is usually the patient that suffers. The offender is not only the general practitioner who puts in an *x*-ray apparatus of his own, nor the medical man who takes up *x*-ray work without any qualification, but the surgeon and physician who may likewise misuse radiology. This is the kind of thing that happens:

A lady over 70 years old falls. The surgeon diagnoses fracture of the neck of the femur. She is radiographed. Unfortunately for the patient the surgeon considers himself capable of interpreting his own radiographs, and congratulates the patient that his diagnosis is incorrect, as he considers the radiograph shows no evidence of fracture. He gets her up. She suffers tortures, and eventually comes to

London; and the radiographs exhibit an ununited fracture of the neck of the femur, the shaft articulating with the ilium. Considerable difficulty was experienced in dissuading her from suing the surgeon. The original radiograph showed an impacted fracture.

Another case: A surgeon, in the face of expert radiographic opinion, decided that an osteoma in a young lad was radiographically a sarcoma and insisted on amputation. Fortunately the parents were persuaded to refuse to submit their son to such drastic treatment.

Many other cases could be quoted by me, and other radiologists could do the same. The qualified radiologist is not infallible, but his opinion is at least based on experience. As the late Sir Archibald Reid said, "Bad radiology is bad for every radiologist and hinders progress."

The medical profession can rest assured that radiologists as a whole are not self-satisfied, but are fully conscious that their standard of qualification must be raised. For this purpose the British Association of Radiologists was founded last year. The association consists entirely of medical men who are devoting their whole time to radiology. Every endeavour will be made to see that men entering on the study of radiology are well versed in clinical medicine, and it is probable that in the near future Fellowships of the association will be obtained only by examination.—I am, etc.,

FELLOW OF THE BRITISH ASSOCIATION OF RADIOLOGISTS.

November 28th.

SIR,—As one who has for a number of years practised radiology along with general practice, I would like to endorse the remarks of Mr. Bertwistle.

Instead of placing difficulties in the way of the general practitioner some encouragement might be given him. It would be as well, perhaps, if a qualification of some years of work in general practice was first obtained before anyone was allowed to submit himself for one of these many diplomas recently introduced. There are many medical men who took up radiology in far from ideal conditions. Yet before submitting themselves for one of the diplomas they are now expected to return to their pre-medical studies and take courses in practical physics and electrotechnics. This might have been useful ten years ago, but with apparatus now "shock-proof" and working technique so much simplified a sound general knowledge of the interpretation of *x*-ray work should suffice, and this could be facilitated by introducing post-graduate courses in clinical radiology.—I am, etc.,

J. HOWARD OWEN.

Fishguard, Dec. 1st.

Asymmetrical Limb Development

SIR,—The interesting case described under the above heading by Dr. Matthew Bowman in the *British Medical Journal* of November 30th (p. 1047) is a typical example of the class which I termed "haemangiectatic hypertrophy" of limbs when I collected the cases bearing on the subject in the *British Journal of Children's Diseases* (1918, xv, 13). These cases had the peculiarity that the developmentally larger limb often showed some form of vascular naevus. Some of the cases had attracted attention on account of so-called "congenital varicose veins." Others had had enlarged arteries, and some had been described as examples of "phlebarteriectasis" because both vein and artery were enlarged. Since then cases have been described under the heading "haemangiectatic hypertrophy" by C. C. Beatty (*Proc. Roy. Soc. Med.*, Children Section, 1927, xx, 20), E. Susman and D. W. McCredie (*Med. Journ. Australia*, 1927, ii, 581), A. M. H. Gray (*Proc. Roy. Soc. Med.*, Dermatological Section, 1928, xxi, 65), Pautrier and Ullmo (*Ann. de Derm.*, 6th series, 1929, x, 1195), and H. L. Blumgart and A. C. Ernstene (*Arch. Int. Med.*, 1932, xlix, 599).—I am, etc.,

F. PARKES WEBER.

London, W.1, Nov. 30th.

The Quality of Sunlight

SIR,—The phenomenon discussed in Dr. W. P. Kennedy's letter in the *Journal* of November 9th (p. 924) is a very interesting one. Here in Egypt the same phenomenon is observed. Exposure to the sun in the summer-time can cause very nasty burns of first and second degree, but it seems awfully difficult to acquire that popular sun-burnt hue. When I was in Iraq I remember hearing a native saying which could be interpreted "When the dates get browner the white man's face gets whiter."

I am in no way a physiologist, but I am not at all sure if pigmentation or light conditions come into the explanation. Could it not be that in the hot weather the skin is covered with a tiny film of perspiration which prevents the sun from "burning" it? I have noticed that residents of the "hill country" get very sunburnt, whereas those in the plains, perhaps only a few miles away, remain pale. In Egypt I have noticed that residents of Alexandria, where the temperature is really very little different from that of Cairo, get much browner than residents of the latter city, although they are not necessarily more exposed. The chief difference appears to be a more consistent sea breeze, which tends to keep the skin drier.

One can say that one day "on the beach at Bournemouth" will produce a tan far superior to anything one can acquire in the whole summer in Egypt. Observe the magnificent tan a "winter-sports" enthusiast returns with from Switzerland, where the air is dry. Also, a slice of new bread always takes longer to toast than a stale piece.—I am, etc.,

PHILIP H. PERKINS, M.R.C.S., L.R.C.P.,
Flight Lieutenant R.A.F.M.S.

Cairo, Nov. 22nd.

Occupational Skin Diseases

SIR,—In his article in the *Journal* of November 23rd (p. 996) Dr. Irvine attributes to me statements which I did not intend to make. If he reads my paper more carefully I think he will find that we do not disagree as much as he imagines. I did not state that non-scrotal cancer in the mule-spinner was not occupational. What I said was that the occurrence of skin cancer in a mule-spinner did not make it necessarily an occupational disease, but that some further evidence of an irritative factor should be present before such a diagnosis is made. Obviously some other factor is responsible for skin cancer—in a clerk, for instance. Is it unreasonable to suppose that this factor may account for some, at least, of the skin cancers occurring in mule-spinners? Furthermore, in being able to confirm from my own experience the work of Dr. Robertson, I do not state that cancer of skin is not due to mineral oil, but merely put forward another possible contributory cause. As a clinician, I am not qualified to dispute the theses of competent research workers in this direction.

Frequently the diagnosis of trade dermatitis is made for any skin lesion in a manual worker, whether irritation by dust or by liquids can be proved or not. In the hope of rescuing skin cancer from the same unscientific position I have tried to find some means of differentiating the occupational from the non-occupational forms. That I have failed is made manifest by the misinterpretation of my remarks by Dr. Irvine.—I am, etc.,

ALEX. R. SOMERFORD.

Manchester, Nov. 25th.

Chloroform Anaesthesia

SIR,—Dr. Mills asks me to state the points in his letter of October 26th which are not in accordance with experimental evidence. I think that, in reply, a single quotation will suffice, as follows. "The use of the term 'death due to light anaesthesia' is unjustifiable, and conveys the wholly false and dangerous doctrine that safety can be found in giving more chloroform." Dr. Mills is herein referring to sudden death from ventricular fibrillation under chloroform. This quotation is not in accordance with experimental evidence, which demonstrates that ventricular fibrillation can occur under the predisposing influence of light chloroform anaesthesia, but does not occur under the influence of full surgical chloroform anaesthesia.—I am, etc.,

Marlow, Bucks, Nov. 23rd. A. GOODMAN LEVY.

The Minnitt Apparatus in Dentistry

SIR,—Knowing what a great aid as an analgesic agent in midwifery is the recently introduced Minnitt gas-air machine, it seemed possible that it might also be useful in dental surgery where a general anaesthetic is not required. We have therefore tried it out at the Liverpool Dental Hospital and find that it works admirably.

Most people who visit the dentist regularly have experienced the painful sensation of the drill working over an exposed root pulp or in the sensitive dentine near the gum margin, so it is worth while to call the attention of our dental colleagues to a further use for this ingenious and almost fool-proof apparatus.—I am, etc.,

Liverpool, Nov. 25th. G. F. RAWDON SMITH.

Idiosyncrasy to Aluminium?

SIR,—It is unfortunate that the Ministry of Health should take sides in the important controversy as to the danger to health arising from the use of aluminium and issue a report by Dr. G. W. Monier-Williams which is so strongly in favour of aluminium that you in your editorial of November 2nd state: "The last word now seems to have been said, and the opponents, if their sense of humour is sufficiently strong, will surely feel they must give up the ghost." The clinical evidence of practitioners in all parts of the country is overwhelmingly convincing that food contaminated by aluminium acts as a powerful irritant in certain persons, and the number of such cases increases as attention is drawn to this source of poison. The fallacy arises from the fact that the reports on the employment of aluminium cooking vessels merely prove that no trace of aluminium can be found in the food prepared in aluminium vessels. This cannot be denied, but the fact remains that food which has been in any way contaminated by aluminium contains *something* which acts as an irritant poison to certain persons. It has been suggested that it may be fluorine or some radioactive substance. I myself am so susceptible to this irritant, whatever it may be, that I can tell by sampling any food whether it has come in contact with aluminium. I have demonstrated this in the case of certain prepared soups, cheese, glucose, milk, etc. The makers of the various articles have acknowledged that they are made in aluminium vessels, but they have assured me that the most careful analysis has failed to detect the slightest trace of aluminium in the food. By making use of my experience gained in this way I have on various occasions put an end to patients' abdominal troubles by stopping the taking of certain articles. Therefore it is not sufficient for a report simply to prove that food prepared in aluminium vessels contains no aluminium. Before this question can be settled further investigation is required to ascertain what other effect, if any, aluminium can have upon food brought in contact with it.—I am, etc.,

London, W., Nov. 28th. ALEXANDER FRANCIS.

*** A letter by Professor H. E. Armstrong, F.R.S., in the *Times* of December 3rd may be commended to the notice of readers who think with Dr. Francis.—ED., *B.M.J.*

Persistent Vomiting

SIR,—I was interested to read a letter by Dr. N. S. Finzi in the *Journal* of November 30th (p. 1072) on the use of adrenaline solution in persistent vomiting. I think I am right in stating that, about 1918 or 1919, Sir Walter Langdon-Brown suggested to his clinical clerks (at St. Bartholomew's) the use of a draught containing liq. adrenalin., ac. hydrocyan. dil., tinct. card. co., and liq. bismuthi as a treatment for vomiting. For some years I have used such a draught in my practice with excellent results, even in the severe vomiting of a migraine attack.—I am, etc.,

Harrow-on-the-Hill, Dec. 1st. H. NEWTON ANDREWS.

Medical Science and Social Progress

SIR,—The discussion in your columns under the above heading seems to me to be really a matter more suitable for a journal of social science. Medical science is but a small field in the social estate. The view of the workers is limited by ranges of hills surveyed and unexplored; and so doctors are liable to take a parochial view and to apply homely remedies with the zealousness of the peasant.

It is true that we pass for educated men, but it must be admitted that few of us have the time for such serious study as social science, and that fewer have the inclination. We are therefore all the more likely to be led into strange fields by those we have been accustomed to follow in the better-known tilled lands of medicine. As a medical leader we have standards by which to judge him, and because he comes up to those standards we may forget to judge him when he begins to wander. We are liable to forget that a "specialist is one who keeps on learning more and more about less and less." Most of us are not in a position to analyse generalized statements such as those made by Mr. Lockhart-Mummery, besides other obiter dicta which escape the vigilance of the editor from time to time.

It is sufficient for the purposes of this letter to warn readers that Mr. Lockhart-Mummery's letter hardly contains one sentence which would survive informed criticism. It takes as facts assumptions which have hardly attained the rank of working hypotheses. It draws conclusions from statements which would be difficult to satisfy a logician. It mixes the question of over-population with the theoretical one of automatic increase of hereditary deficients. Natural processes, starvation, plague, and cannon fodder are doubtful allies in his campaign.

He hints that the sterilization of the unfit is only the beginning of the crusade for perfection which the more intelligent have in contemplation for the rest of mankind. Once we apply logical thought, do away with sentiment, and cease to be nauseated by the unpalatable or shocked by the repulsive, no more crimes are going to be permitted in thy name, O Liberty!

As a farmer's son I would advise Mr. Lockhart-Mummery not to push the farming analogy too far.—I am, etc.,

M. G. KIERANS, M.B., B.Ch.

Clones, Co. Monaghan, Nov. 26th.

Sir,—"The facts that have to be faced," to which Mr. Lockhart-Mummery alludes in his letter in your issue of November 23rd, are largely a result of legislative interference with the processes of nature. To eradicate any evil it is first of all necessary to consider and deal with the aetiological factors concerned. In bygone days it was quite customary for candidates at political elections to influence electors by gifts of money out of their own pockets, but is not the bribery and corruption much worse when electors are influenced by promises depending on the transference to them of money from the pockets of other people? It is manifest that such a system must result in the development of a habit of thought which is lacking in natural justice.

At a discussion on the question of sterilization recently I was struck by the fact that the main contention of those opposing it appeared to be that in the present state of our knowledge regarding the facts of heredity such a procedure was an unwarrantable interference with an individual's right to propagate his species; no mention was made of the capability of an individual for parenthood—namely, the capacity to bring up and provide for children, without which the offspring must become a charge on others. Why? Because under our present sociological system the child of the degenerate must be given opportunities almost equal to those personally provided for his children by the self-reliant parent.

With regard to the facts of heredity, surely the gradual development of a national character is a proved fact, dependent, largely, on transmitted familial characteristics the result of generations of suitable blending. The evils we are now trying to combat are the result of interference with natural justice, and instead of considering and dealing with the causes thereof we are simply perpetuating and intensifying them. There are some things which cannot be done—for instance, a substance cannot be dissolved in a medium in which it is insoluble without entirely altering the character of that substance. So, if by artificial means the environment and habit of thought of a being is altered then the character will change. It is well to remember, however, that "Naturam expellas furca, tamen usque recurret."—I am, etc.,

Stafford, Nov. 30th. B. H. Shaw, M.D.

Birth Control in Modern Life

Sir,—While I welcome Dr. Murphy's effort to "call a spade a spade" (*Journal*, November 30th), she does not enlighten us as to how—if there be any "virginal" brides among us these days—the insertion of a pessary is possible. Her opinion of the reception given to babies "born on the district," apparently diametrically opposite to that of Sir Walter Langdon-Brown, is in my experience as true as his, the only difference being in point of time. Sir Walter's observation was doubtless made on leaving a case at the end of the puerperium, when the mother contemplated getting up to face hard facts, whereas Dr. Murphy recalls the song of praise and thanksgiving so universally rendered by mothers during the first few days of the puerperium, when every mother welcomes, not necessarily her child, but the release from pregnancy and labour.

On this subject of birth control *versus* self-control, does the Bishop of St. Albans seriously contend that a happily married couple, with even so huge a family as four children, should confine their intercourse to four periods of, say, six months during the whole of their married life? If, on the other hand, he advocates that vicious practice of coitus interruptus, he would have us a nation of neurasthenics in no time, again as the result of the "frustration of the biological ends of Nature."—I am, etc.,

Porlock, Dec. 1st. J. F. P. Forster.

Recording of Vote by Invalids

Sir,—During the recent General Election I had several patients who, being unfit to leave their homes, yet did so at considerable risk of aggravating their condition, in order to record their vote; and many more prudent ones who remained at home, and were thus disfranchised.

I suggest that our medical members in Parliament should be asked to press for the removal of this injustice, and to urge that duly certificated invalids be permitted to record their votes otherwise than by personal attendance.—I am, etc.,

Barnet, Herts, Nov. 26th. S. Vatcher, M.D.

Obituary

ERNEST WILLIAM WHITE, C.B.E., M.B.

Emeritus Professor of Psychological Medicine, King's College, London

We regret to record the death, on November 28th, of Dr. E. W. White, who had been professor of psychological medicine at King's College, London, from 1890 to 1910. He was 84 when he died at his home in Shrewsbury.

The second son of Richard White of Norwich, Ernest William White was educated at King Edward VI School at Bury St. Edmunds, and received his professional training at King's College, London, where he won three scholarships, and was a gold medallist in anatomy. In 1872 he obtained the diploma M.R.C.S., and in the following year the L.S.A. He graduated M.B.Lond. in 1883, and a few months later became M.R.C.P. From 1878 to 1887 he was senior assistant medical officer of the Kent Mental Hospital at Chartham, after which he was resident physician-superintendent of the City of London Mental Hospital at Dartford until 1905. During this time he was elected professor of psychological medicine at King's College, London. In the war he served as consultant in mental diseases to the Western Command; he was promoted to lieutenant-colonel in 1917, and was created C.B.E. in 1920. He was a consultant to the War Office from 1919 to 1921.

Professor White joined the British Medical Association in 1884, and twenty years later was a vice-president of the Section of Psychological Medicine when the Association met at Oxford. He was a representative at the Annual Meetings at Toronto in 1906 and at Exeter in 1907. He was president of the Royal Medico-Psychological Association from 1903 to 1904. He was the author of numerous contributions to medical periodicals, including more particularly the *British Medical Journal* and the *Journal of Mental Science*. Since 1906 he had been chairman of Bailbrook House, Bath, and of Fenstanton, London, both mental hospitals. He took great interest in farming, and was president of the Shropshire Chamber of Agriculture in 1922 and the following year. In his younger days he had been a cricketer and a cyclist, and he continued to shoot and fish from middle age.

Dr. John Macdonald Brown, who died in London on November 18th at the age of 78, had previously been in practice at Leamington and later in Upper Berkeley Street, London. Born in Dunfermline, he had been a student in the University of Edinburgh, where he held a Grierson bursary, and at the London Hospital. In 1880 he graduated M.B., C.M.Ed., and three years later obtained the diplomas F.R.C.S.Eng. and F.R.C.S.Ed. He proceeded M.D. in 1890 with honours. His earlier appointments included those of lecturer in anatomy at Surgeons' Hall, Edinburgh; examiner in anatomy for the Royal College of Surgeons, Edinburgh, and the University of Aberdeen; and senior assistant surgeon to the North-West London Hospital. Dr. Brown had

contributed papers to various scientific and medical periodicals. He was a J.P. of the County of London, and had been a member of the British Medical Association for forty-six years.

Dr. ROBERT GOURLAY, who had practised for fifty years in Oldham, and had twice been mayor of the town, has died at the age of 76. Born in Kirkintilloch in November, 1859, he received his medical education in Glasgow, where he graduated M.B., C.M. in 1883, winning the medal for surgery. He had held the appointments of district medical officer and public vaccinator, and was a referee for assurance societies. He took an active interest in politics, and associated himself with civic and social activities in Oldham. He became a member of the British Medical Association in 1890, and was a representative at the Annual Meeting of the Association at Eastbourne in 1931.

Medico-Legal

SUSPECTED CASE OF AGRANULOCYTOSIS: INQUEST PROCEEDINGS

A case which was originally reported as agranulocytosis, possibly due to amidopyrine, known chiefly in this country under the name of pyramidon, was the subject of a coroner's inquiry at Shoreditch on December 3rd. The deceased was a woman named Harriet Juler, aged 55. The coroner (Dr. R. L. GUTHRIE) told the jury that at the first hearing it was reported that while in Bethnal Green Hospital she had shown certain symptoms which corresponded to agranulocytosis, and on a blood examination the white blood corpuscles were found greatly diminished. This diminution could be brought about by amidopyrine, and there was evidence that the woman had been from time to time taking certain tablets, known as "yeast-vite," which contained this substance. According to the evidence of the husband, she had taken them for a headache or a cold, but he had never seen her take more than two at a time, and the last time she took them was about three weeks before her death. She had severe pyorrhoea and a swelling in the cheek, which was incised at the hospital.

Dr. F. TEMPLE GREY made a report on the post-mortem findings. In view of the leucopenia and the hyperpyrexia it was necessary to exclude typhoid and malaria, and this was done. His diagnosis was staphylococcal septicaemia, and this was confirmed by histological slides of spleen, kidney, liver, and bone marrow supplied to him by Dr. Newcomb of St. Mary's. Dr. Newcomb found also an agranulocytosis—he (Dr. Temple Grey) used the article "an" advisedly, for this condition was found in association with other causes than amidopyrine poisoning, especially if the term was used broadly to include not only cases in which there was an entire absence of granulocytes, as in the seven cases (six fatal) from Copenhagen recently recorded by Plum, but cases, like the one under inquiry, in which there was only a great reduction. An incision was made in the parotid in this case under evipan anaesthesia, and evipan might cause a fall in the total white count and be a complicating factor. Again, operative intervention in his experience not infrequently precipitated a fatal septicaemia in cases of this type. The suspicion of agranulocytosis had been raised by the extreme degree of leucopenia (600 leucocytes per c.mm.), but the differential count (polymorphonuclear cells 28 per cent., large lymphocytes 25 per cent., small lymphocytes 46 per cent., large hyaline 1 per cent.) was not typical of agranulocytosis, the polymorphonuclears being too high, and the absence of ulceration of mouth or tonsils was against that condition. The obvious cause of death in this case was septicaemia associated with dental sepsis, the blood condition being probably secondary to this (exacerbation of low-grade septicaemia).

In reply to Mr. G. D. Roberts (Treasury counsel) Dr. Temple Grey said that in his opinion the "yeast-vite" tablets were not in any way responsible for the condition. He preferred, for such a condition as existed in this case, the term "oligo-granulocytosis."

Mr. J. H. RYFFELL, official analyst, said that from a section of the liver he obtained a small amount of substance corresponding to pyramidon. As the deceased had not obtained any of this substance for some while before death, pyramidon appeared to be retained in the body for an unusual time. The 5-grain "yeast-vite" tablets contained pyramidon in the proportion of 12.8 per cent. He thought it might well have contributed to the lowering of the white-cell content, and therefore of the resistance. On the packets of "yeast-vite" the chemical formula was given: "dimethyl aminophenyl-dimethylisopyrazolone," and the coroner asked whether these abnormally long names were not somewhat deceptive to the public. The witness appeared to agree with this view, but Mr. Roberts, the counsel, joined issue, and asked whether the long name of forty letters was any less intelligible to the public than the short word pyramidon or amidopyrine, which had been for years a drug permissibly used in medicine. He put it to the witness that in the *British Pharmacopoeia, 1932*, a dosage of 5 to 10 grains of amidopyrine, presumably three times a day, was mentioned. If two tablets of "yeast-vite," each containing five-eighths of a grain, were taken, it would amount to 4 grains of the substance a day, as against a maximum of 30 grains a day according to the *Pharmacopoeia* recommendation. Mr. Ryffell suggested that there might be undesirable effects from the substance taken, not in large quantities, but over a considerable period. He agreed that he could not state definitely that the substance found in the liver was pyramidon, it might have been antipyrine; it was certainly not of the phenol group or one of the constituents of aspirin.

Dr. ARTHUR NORMAN JONES said that the woman was admitted to Bethnal Green Hospital on November 12th and died on the 15th. The illness began about three weeks before admission, when a swelling appeared in the cheek, which increased in size, and she had headache and vomiting. A very high temperature developed. It was stated that she had at irregular intervals taken "yeast-vite" tablets. Her general condition was consistent with parotid abscess. On admission to hospital it was decided to operate, and anaesthesia was induced by an intravenous injection of 6 c.cm. sodium evipan. No pus came from the incision in the parotid swelling. There was some improvement next day, but on the day following she was worse. The blood count was: red blood corpuscles, 3,700,000; haemoglobin, 76 per cent.; colour index, 1; and white blood corpuscles, 600. Next day the white blood corpuscles had fallen to 450. During the last two days three intramuscular injections of pentneucleotide were given. The blood which was taken for culture grew *Staphylococcus aureus* very abundantly. Transfusion was given after the first blood count. He believed the case to have been one of definite agranulocytosis associated with septicaemia. He did not think anyone could say that the pyramidon was the cause of death, especially as she had very septic teeth, which in themselves would have set up the condition of septicaemia. He thought the septic condition of the teeth might have acted upon the bone marrow, where the white cells were developed.

Sir WILLIAM WILLCOX said that pyramidon was a drug which had been used for many years as a remedy for headache and for the relief of pains in rheumatism. Its association with the condition of the blood known as agranulocytosis had only been discovered recently. He had prescribed the drug on innumerable occasions, but these reports made one cautious, because one person in a thousand might be very sensitive to a particular drug. He had been present with Dr. Temple Grey at the post-mortem examination, and his opinion was that this person died from acute septicaemia, due to the staphylococcus, which septicaemia was precipitated by the exceedingly septic condition of the teeth, causing the abscess in the parotid gland. In deaths from amidopyrine there was exudate on the tonsils, often mistaken for diphtheria; there was none in this case. He agreed with Dr. Temple Grey that the blood count also was against this as a death from amidopyrine. In amidopyrine cases, with the poison acting for some long period on the blood, practically the whole of the granular leucocytes had disappeared at the stage at which the blood was examined, but here they were in the proportion of 28 per cent. Asked if any inference could be drawn from the urine, Sir William Willcox said that in amidopyrine poisoning the urine was a dark red-brown. Dr. JONES intervened to say that so far as he was aware the urine in the

case under investigation was always clear. Asked finally whether it was conceivable that tablets taken in this occasional way, and apparently not at all during the last three weeks, could have had any effect in accelerating death, Sir William Willcox replied that he was quite satisfied in this case that they could not.

Mr. F. E. HELMSLEY, general manager of the Yeast-Vite Company, said that the annual sale of the tablets exceeded thirteen hundred million. There had been no complaint as to any deleterious effect, but when amidopyrine was recently criticized by certain experts at the Poisons Board his company, from May of this year, substituted another constituent for amidopyrine, and all "yeast-vite" tablets issued since last June had had amidopyrine excluded. With regard to the formula on the bottle and packet, if a drug consisted of more than one constituent such formula had to be given.

The CORONER, in summing up, said that agranulocytosis was discovered in 1922 by Schultz, but he thought most of the cases in which amidopyrine was implicated were recorded during the last two years. Amidopyrine poisoning was very fatal, and it might be that some restraint should be placed on the sale of this drug. The view of the medical witnesses in this case, however, was that this was a death due to septicaemia in association with septic teeth, though Mr. Ryffell found in a section of the liver a substance which resembled pyramidon.

The jury agreed that death was due to septicaemia arising from dental sepsis, and the coroner returned a verdict to that effect.

ALLEGED TREATMENT OF VENEREAL DISEASE BY UNREGISTERED PRACTITIONER

On November 9th and 28th, at Marylebone Police Court, before Mr. Reginald McKenna, Mr. Robert Vivian Storer of Cavendish Square, W., appeared on four summonses that, not being a qualified medical practitioner, he had, for reward, treated two patients for venereal disease, that he prescribed a remedy, and, by advertisement, offered to treat any person for the disease, contrary to the Venereal Diseases Act, 1917. In May last the General Medical Council ordered Mr. Storer's name to be erased from the *Medical Register*, following a charge of having advertised in the lay press a clinic for the treatment of these diseases (*Supplement*, June 8th, 1935, p. 248).

After the removal of his name from the *Register* Mr. Storer continued to advertise, and it was stated on behalf of the prosecution that to two men who answered his advertisements he stated that he could cure them, and asked for a fee of 100 guineas. They both said they could not pay such an amount, and in one case he reduced it to 40 guineas, but the man refused the treatment; in the other case the man paid 30 guineas and received a certain number of treatments.

In the witness-box Mr. Storer stated that he founded the "Cavendish Institute of Medical Research" in January, 1934. His research work on this subject had cost him £20,000. He had asked the General Medical Council whether his advertisements could possibly form a ground of complaint, but instead of giving him a definite reply the Council set its disciplinary machinery in action. Following the erasure of his name from the *Register* he had amended his advertisements, fully realizing that he was no longer allowed to treat venereal diseases, and he had made it clear that his service was only available for diagnosis. He referred persons who came to him, including those mentioned in the charge, to proper sources for treatment. On Mr. Storer's behalf it was contended that diagnosis was not a part of treatment, also that a man with Mr. Storer's qualifications and attainments was not the sort of quack against whom the Act was aimed.

The magistrate said that in his view diagnosis was undoubtedly a part of treatment, and for that reason alone the case against Mr. Storer was proved. Where there was conflict in the evidence he accepted that of the two witnesses who had gone to Mr. Storer for treatment. The skill or distinction of the defendant had no bearing on the case as against the definite prohibition laid down in the Act. He fined Mr. Storer a total of £80, with 20 guineas costs, on the summonses for treatment of patients, and a further £20 for advertising to treat the disease.

It was intimated that there would be an appeal on a point of law.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The Speech from the Throne was read by the Lord Chancellor in the House of Lords on December 3rd. The Lords that day completed its Debate on the Address, and Lord Luke presented the Voluntary Hospitals (Paying Patients) Bill, which was read a first time.

The King's Speech announced the forthcoming appointment of a Royal Commission to review existing provisions for the safety of workers in mines in the light of modern scientific knowledge. It announced that the improvement of school medical arrangements and the extension of physical education would receive the attention of the Government, in co-operation with local authorities and others. Bills raising the school age would be presented for England and Wales and for Scotland. The Government pledged itself to promote the development of the social services, and to take vigorous measures to improve the health and physique of the nation. It would press forward the work of slum clearance, and encourage the direct attack on overcrowding under the Housing Acts of 1935. A Bill would be introduced for the provision by local authorities, in co-operation with voluntary associations, of an organized service of salaried midwives. Ministers would give close consideration to further improvement of conditions in Scotland.

Speaking during the Debate on the Address in the House of Commons on December 3rd, Mr. BALDWIN said a Bill for the consolidation of the law relating to the safety, health, and welfare of factory workers would, he hoped, be introduced in Session 1936–7. Questions relating to physical education were to be discussed with local authorities. He begged the House to do its best to get the Maternity and Midwives Bill through this session before the summer recess. Mr. Baldwin announced that the introduction of Bills by private members would not be permitted till after Christmas.

The Commons continued the Debate on the Address on subsequent days of this week.

The Medicines and Medical Appliances Bill may be introduced in the House of Lords.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Pinsent-Darwin Studentship in Mental Pathology

An election to the above studentship will be made in January, 1936. The studentship is of the annual value of about £225, and is tenable for three years. The student must engage in original research into any problem having a bearing on mental defects, diseases, or disorders, but may carry on educational or other work concurrently. Applications should be sent before January 1st, 1936, to the secretary, Pinsent-Darwin Studentship, Psychological Laboratory, Cambridge. Applicants should state their age and qualifications, and the general nature of the research that they wish to undertake. No testimonials are required, but applicants should give the names of not more than three referees.

At a congregation held on November 30th the following medical degrees were conferred:

M.D.—E. H. W. Lyle, T. K. S. Lyle.
M.B., B.CHIR.—C. L. Collins, J. S. Cookson, B. T. Thorne, A. H. M. Siddons.
M.B.—F. H. Finlaison, H. B. Tipler.

UNIVERSITY OF LONDON

The following candidates have been approved at the examination indicated:

POST-GRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—(*With Special Knowledge of Psychiatry*): W. P. Berrington, J. R. P. Edkins.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—F. E. Bedell.
MEDICINE.—E. E. LeFeuvre, M. A. Partridge.
FORENSIC MEDICINE.—M. A. Partridge.
MIDWIFERY.—H. Firman, O. A. L. Goode, N. R. James, F. R. Neubert, C. J. Robarts, G. N. Rodgers, J. W. Thomas, P. Tobin.

The diploma of the Society has been granted to H. Firman, E. E. LeFeuvre, and F. R. Neubert.

The following candidates have been approved at the examination indicated:

MASTERY OF MIDWIFERY.—Marion Bow, Maurice William Ginsberg, Hilda Linford, Hugh Temple Tate, Elizabeth Shanks Walker.

Medical News

The House of the British Medical Association, including the Library, will be closed for the Christmas holiday from 6 p.m. on Tuesday, December 24th, to 9 a.m. on Friday, December 27th (Library 10 a.m.).

The House and Library of the Royal Society of Medicine will be closed for the Christmas holiday from Monday, December 23rd, to Saturday, December 28th, both dates inclusive.

The Prince of Wales, president of the hospital, will open "Nuffield House," the new building for paying patients at Guy's Hospital, on Tuesday, December 10th, at 3 p.m. The new block will be open to the inspection of any members of the medical profession on Wednesday, Thursday, and Friday, December 11th, 12th, and 13th, between the hours of 10 a.m. and 6 p.m.

The Voluntary Euthanasia Legalization Society, the formation of which has aroused so much interest, is holding its inaugural public meeting on Tuesday, December 10th, at 8 p.m. in the Great Hall, B.M.A. House, Tavistock Square, W.C.1. Lord Moynihan, president of the society, will take the chair, and the list of speakers includes Mr. C. J. Bond, F.R.C.S., Dr. Killick Millard, Lord Listowel, Sir Arnold Wilson, M.P., Miss E. Rathbone, M.P., and the Rev. Dr. F. W. Norwood. Admission is free.

The seventy-third annual meeting of the Royal Surgical Aid Society will be held at the Mansion House, E.C., on Monday, December 9th, at 4 p.m. The Lord Mayor will preside and will be supported by Professor G. Grey Turner, among others.

On December 12th Dr. Bruce Williamson will read a paper before the North London Medical and Chirurgical Society on "The Clinical Significance of the Cardiac Innervation." The mid-sessional address will be given by Dr. Bellingham Smith, on January 15th, on the subject of "Continued Fever." On February 13th Dr. W. R. M. Turtle will give a clinical demonstration at the St. Mary Islington Hospital. Dr. J. L. Livingstone will give an address on "Asthma" on March 13th. All the meetings will be held at the Royal Northern Hospital, Holloway Road, N., except the one on February 13th.

At a meeting of the Pharmaceutical Society of Great Britain, on Tuesday, December 10th, at 17, Bloomsbury Square, W.C., Dr. Percival Hartley, director of the Department of Biological Standards at the National Institute for Medical Research, will give a lecture on "International Biological Standards for Drugs and Therapeutic Substances." The chair will be taken by the president at 8.30 p.m., and refreshments will be served after the lecture.

A discussion on "The Cause and Modern Treatment of Speech Disorders" will be opened by Dr. E. J. Boome at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., on Tuesday, December 10th, at 5.30 p.m., with Dr. Ralph H. Crowley in the chair.

The Lord Mayor of London has issued invitations to a meeting in support of Red Cross work in Ethiopia at the Mansion House on Thursday, December 12th, at 3 p.m. Those present will include Lord Lugard, Sir Austen Chamberlain, and Sir Arthur Stanley.

A reunion for friends and students of the Post Certificate School will be held on Friday, December 13th, to meet Dr. John S. Fairbairn, chairman of the Central Midwives Board. Tea at 4 p.m. at St. John's Home, Watson Street, Deptford, S.E.8. Address at 5 p.m., on post-certificate work, by Dr. Fairbairn, at 77, Southampton Street, Camberwell, S.E.5. Conveyances are provided.

The Fellowship of Medicine announces the following special courses: dermatology at St. John's Hospital, January 2nd to 30th; cardiology at National Hospital for Diseases of the Heart, January 13th to 24th; urology at St. Peter's Hospital, January 20th to February 1st; proctology at St. Mark's Hospital, February 3rd to 8th. Week-end courses include diseases of the heart and lungs at Royal Chest Hospital, January 18th and 19th; and physical medicine at St. John Clinic and Institute of Physical Medicine, February 8th and 9th. An evening course of surgical tutorial lectures, especially intended for Final F.R.C.S. candidates, will be given on Tuesdays and Thursdays at National Temperance Hospital, January 14th to March 5th. The full list of special courses for 1936 will be ready shortly, and may be obtained on application to the Fellowship of Medicine, 1, Wimpole Street, W.1.

The third annual exhibition of microscopes will be held at Central Hall, Westminster, S.W., from December 9th to 14th, from 2.30 p.m. to 9 p.m. daily, except December 14th, when the exhibition closes at 7 p.m. There is no charge for admission, and programmes may be obtained from Messrs. W. Watson and Sons, Ltd., 313, High Holborn, W.C.1.

The fifth Rumanian Congress of Urology will be held at Bucarest from December 15th to 18th, when a discussion will be held on the dynamism of the upper urinary tract, introduced by Professor Hortolomei and Drs. Burghele, Zanne, and Streja, in addition to various papers on the bladder, urethra, and genital organs. Further information can be obtained from the general secretary, Dr. Popescu Buzea, 14, Putu, Bucarest 11.

Lord Melchett presided at the sixteenth annual reunion dinner of Queen Alexandra's Hospital for Officers on November 29th at the Hotel Splendide, when nearly fifty of the former patients and members of the nursing staff were present. During the evening a message of good wishes was received from the late Princess Victoria. Lord Melchett proposed the health of the former patients, and, in his reply, General T. A. Bigge expressed the gratitude and appreciation of the officers for the devoted work of Mr. and Mrs. Herbert Paterson, the matron, nurses, and voluntary workers of the hospital.

An oxygen tent has been placed at the disposal of the quadruplets, born at Eynesbury, Huntingdonshire, on November 28th, by the British Red Cross Society. This step has been taken not because the babies show any sign of illness or retarded progress, but in case such an eventuality should arise. In America and on the Continent oxygen tents have been in frequent use for many years, not only in extreme cases of cardiac and pulmonary disease, but as a preventive and alleviative measure.

The issue of the *Annales de l'Institut Pasteur* for October 25th is a special number commemorating the fiftieth anniversary of the first inoculation for rabies by Pasteur. The issue of the *Wiener klinische Wochenschrift* for November 15th is dedicated to the Medical Association of Upper Austria on the occasion of the seventieth anniversary of its foundation. The issue of *Paris Médical* for November 16th is devoted to social medicine and medical jurisprudence.

Professor J. Graham Kerr, F.R.S., who succeeded Lord Tweedsmuir (formerly Mr. John Buchan) as one of the representatives of the Scottish Universities in Parliament, successfully defended his seat in the House of Commons at the recent General Election. He recently resigned the regius chair of zoology in the University of Glasgow.

The University of Hamburg is henceforth to be known as the Hansa University.

Professor Achard has been unanimously re-elected permanent secretary of the Académie de Médecine.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

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The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Haematuria following Abdominal Strain?

Dr. M. BRADFORD (Ebbw Vale) writes: Is it possible to develop a haematuria as a result of a sudden contraction of the abdominal muscles (presumably causing compression of the kidney) in a healthy subject? The patient, a steel-worker in the twenties, is lean, muscular, and narrow chested. He is engaged in pulling metal sheets out of a furnace with a long pair of tongs. When some of the sheets slipped he suddenly jerked himself forwards. This caused slight abdominal pain, but he went on working. An hour later he passed urine intimately mixed with blood. This cleared up in a few days with rest. He has had no urinary symptoms before or since.

Pruritus Vulvae et Ani

Dr. R. D. MOYLE (Eastbourne) writes in reply to "Perplexed" (*Journal*, November 23rd, p. 1029): Although the urine is normal the large area involved makes one think of diabetes and whether it would not be worth while having the blood sugar determinations done. Failing this, it has been my practice for some time to give all such cases injections of ovarian hormone. I would suggest oestroform, one ampoule twice weekly: begin with the 1,000-unit ampoule and give injections for three to four weeks, and if necessary change over to the 10,000-unit ampoule. It should not be given during menstruation. Locally, other anti-pruritics having failed, percaine ointment is often temporarily successful.

"J. P. B." writes: One of the most soothing and healing lotions I know of is 1 oz. of liq. plumbi subacet. fort. in 6 oz. of new milk. This is an old friend of mine, and better than liq. plumbi subacet. fort. mixed with egg albumen water. Ung. glyc. plumbi subacet. is good at times. Internally pot. citrate often does good also, and 1 grain of parathyroid gland with 5 grains of calcium lactate might be tried once a day in tablet form.

Oxaluria

Dr. ALISTAIR FRENCH (Greenford, Middlesex) writes: I suppose "A. B. C." (November 23rd, p. 1029) is quite sure that his patient's symptoms are definitely due to the passage of oxalate crystals. If so the following treatment should benefit: *Diet.*—Avoid chocolate, rhubarb, spinach, tomatoes, asparagus, and gelatin; increase meat in the diet, as it increases the acidity of the urine. *General.*—Remedy any tendency to hypochlorhydria; give a calomel purge followed by mag. sulph. once a week; and order plenty of fluids, including Contrexeville water for its acid carbonates.

"Black Tongue"

"R. M." writes in reply to "G. T. B." (November 23rd, p. 1029): The best article of recent years on this subject appeared in the *B.M.J.* of April 18th, 1931, by Gleave and Hallam, entitled "Black Hairy Tongue." In the case reported a cryptococcus was found. The condition cleared up readily with a liq. potass. mouth wash. In one case under my care recently a monilia-like fungus was present not only in the "hairy" covering of the tongue, but also in the muscle, but no mycelia could be seen. It was probably a cryptococcus. The mouth wash failed with this patient. He was then given a prescription containing liq. arsenicalis, tinct. ipecac. and glycerin āā 1 drachm in aqua menth. pip. to the ounce, to be painted on t.i.d. The response was satisfactory. An American writer has reported treating a case with 50 per cent. trichloracetic acid. The tongue was first dried and then the acid applied with a cotton swab until the surface turned a greyish-white. It is stated that one application is usually enough, but it may require two or even three.

LETTERS, NOTES, ETC.

Ilford Radiographic Department

A radiographic department of Ilford Limited has been opened at Tavistock House North, Tavistock Square, in premises of which the British Medical Association is the landlord. It has been arranged as a convenient meeting-place for those interested in radiography and radiology generally, and comprises a completely equipped *x*-ray department with the most modern apparatus (in installing which the firm has had the assistance of A. E. Dean and Company), a studio for clinical photography (in which use is made, among other products, of the new Dufaycolor film for recording in natural colours), model dark-rooms, a small lecture hall, and an exhibition room, filled at the moment with some striking examples of radiographic work. An official house-warming was given by the chairman of the company, Sir Ivor Philipps, on December 2nd. He said that Ilford Limited had always taken the view that its interests did not end with the manufacture and distribution of its photographic materials, but that constant collaboration with the users was highly desirable. This was especially the case with *x*-ray film, the standard of which depended not only on what the manufacturer could supply but on what the radiographer would demand. He hoped that the new department would enable the research and production staffs to keep abreast of the advances in radiography, and no less would afford assistance to the users of radiographic material in overcoming their difficulties and problems. An expression of appreciation from the company present, which included many well-known radiologists, was made by Dr. Duncan White, who said that while excellent tuition was available in the theory of radiography, he knew of hardly any centre in England where practical instruction in radiography could be given. He remembered having to devote many Saturdays to budding radiologists in endeavouring to allow them to make use of the apparatus at a certain hospital without interfering with the routine work. He looked forward to this department as serving as a centre where radiologists and radiographers in their search after knowledge might be instructed in practical matters and learn to avoid pitfalls. The visitors afterwards made an inspection of the rooms, and especially admired the furnishing and decoration whereby the commercialism of the business office and the barrenness of the hospital department are alike avoided. The department is to be staffed by experts under the charge of Miss K. C. Clark, the president of the Society of Radiographers.

Old Medical Portraits

Messrs. Suckling and Co., book and print sellers (13, Garrick Street, Covent Garden, W.C.2) have sent us a copy of their catalogue of portraits of medical men, chemists, anatomists, physiologists, natural philosophers, etc., selected from a large stock of old engraved portraits.

Corrigenda

The end of the sentence in lines four and five of the second paragraph in column one on page 1051 of our last issue should read ". . . or *even* commonly associated with symptoms of hyperthyroidism." At page 1072 in the same number (Mr. Bertwistle's letter) the second and third lines from the bottom of the second column were transposed. The printer's devil had a busy day here last week.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 65, 66, 67, 68, 69, 70, and 73 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 71 and 72.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 256.